Minnesota MEDICINE

PUBLISHED MONTHLY BY THE MINNESOTA STATE MEDICAL ASSOCIATION

JUNE, 1943
Vol. 26 . . . No. 6
40c a copy—$3.00 a year

Printed in U.S.A.

Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 26 **June, 1943** **No. 6**

Contents

Entered at the Post Office in Minneapolis as second class mail matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Published by the Association under the direction of its Editing and Publishing Committee

Annual Subscription—$3.00. Single Copies—$0.40. Foreign and Canadian Subscriptions—$3.50.

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THE PHYSICIAN IN CIVIC LIFE

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Minneapolis, Minnesota

IN the First World War, after the St. Mihiel Campaign, the 5th Division of the U. S. Army, to which I was attached, went back into a training area for re-equipment and further training in preparation for the campaign in the Argonne—an interlude in the midst of war. One beautiful morning during this interlude I was lying in the sunshine on a grassy bank watching the maneuvers in the valley below, when I became conscious of a torrent of bird-song which permeated the atmosphere but which seemed to come from nowhere. I finally located the source of the song, a little bird poised high in the air, almost invisible and motionless except for the fluttering of its wings. It was my first introduction to the skylark, and it came during an interlude in the war. The meetings which we are holding here this week are another interlude in the midst of war—a period of refreshment, re-equipment and further training and preparation for the work that is ahead. And this banquet, with the ladies to add their beauty and charm, on the shore of this beautiful lake, amid these beautiful surroundings, is the skylark in the interlude.

The finances of our Association and the statistics relating to membership are matters of record. We take justifiable pride in the number of our members who are in the Armed Forces of the nation. Our Association and its members work in close harmony with the State Board of Health, and their combined efforts have resulted in a low record of maternal and infant mortality which is not equaled in any other state in the Union. The Association has conducted programs of popular education relating to vaccination and immunization and nutrition. It has initiated new plans for the control of tuberculosis which have attracted nationwide attention. All of these activities, and others not mentioned here, are worthy of more extended discussion but this is not an appropriate time or occasion for a full report of all that is being done or has been accomplished.

The Legislature met this year in its biennial session. As has been the custom for many years, our Association was represented at the Capitol by some of our own members who were entrusted with the responsibilty of watching bills as they were introduced in committees and of acting as spokesmen for the medical profession in matters relating to public health or medical practice. In the course of years of experience with these men, the members of the Legislature have learned to put confidence in them, to trust their judgment and to respect their honesty. It is not to be expected that there should never be a clash of opinions over some controversial matter. Such clash of opinions took place this year. Nothing would be gained by re-opening the controversy now or going into the details of the points at issue, but the controversy was given wide publicity, and it went so far that a resolution was presented to the Senate Committee calling for an investigation of the activities of the representatives of our Association at the

Presidential Address delivered at the ninetieth annual meeting of the Minnesota State Medical Association, Minneapolis, May 18, 1943.

Capitol. This resolution was not adopted, but it was widely publicized, and the very fact of its introduction created, in the minds of many people, impressions unfavorable to the Association.

The controversy with Governor Stassen was concluded amicably, and the Senator who introduced the resolution calling for an investigation, up to the present time, has not replied to a letter asking for specific charges of misconduct or the use of improper methods by men representing our Association. This recent incident may, therefore, be considered as closed, but it, together with the presence of Dr. Judd as our honored guest and the principal speaker on this program, naturally directed my thoughts to the physician in politics as a pertinent and timely subject for consideration this evening.

It is inherent in the minds of men of scientific medical training, that they should be independent and non-conformists. In the medical schools during the Revival of Learning were found the best opportunities for the study of all the sciences, whether it be Medicine or Chemistry or Physics or Astronomy. Astrology became scientific astronomy in the hands of Copernicus, a Pole, and Galileo, an Italian, both students of medicine. Naturally, ecclesiastical authority and the authority of Galen, which had ruled medical thought through the thousand years of the dark ages, surrendered only after a struggle. It required courage of a high order to revolt against such authority. "The scientists and philosophers of the middle ages were allowed the high privilege of showing, by logical process, how and why that which the Church said was true, must be true, and if their demonstrations fell short of, or exceeded this limit, the Church was maternally ready to check their aberrations, if need be, by the help of the secular arm." (Huxley)

One can appreciate, therefore, the courage of Henry of Mandeville when, in the 13th Century, he exclaimed, "God surely did not exhaust all his wisdom in the creation of Galen." But even 400 years later, so great was the power of authority that Harvey wrote that he "felt in some sort criminal to call in question doctrines that had descended through a long succession of years and carried the authority of the ancient," but that he "appealed unto Nature that bowed to no antiquity and was a still higher authority than the ancients."

It is characteristic for scientists to revolt against tyranny of any kind, for tyranny and the freedom demanded by Science are mutually incompatible. Therefore, it is only natural that medical men should be found fighting not only for intellectual freedom, but for political freedom. Warren, who was killed at Bunker Hill, was a physician. Twenty-one members of the first Provisional Congress of Massachusetts were medical men. Six doctors signed the Declaration of Independence and three signed the Constitution of the United States. General Leonard Wood, a great military leader and still greater colonial administrator, was a physician, as was Clemenceau, who led the French nation through the first World War. The list would include such names as Henry Dearborn, for whom Fort Dearborn was named, a Major General of the U. S. Army and Secretary of War from 1801 to 1809. William Henry Harrison, at one time a student of medicine, became a President of the United States. The roster of medical men, who have been distinguished in the political life of this and other countries, would include many of the great names of history. I make no attempt this evening to give a comprehensive list of medical men who have become soldiers or statesmen, but any list, however incomplete it may be, should include the name of Sun Yat Sen, the physician who became the first President of the Republic of China. The name of China is inextricably linked with the names of men who have gone to China, not to exploit the country and its people, but to help and advise them. These men have contributed to the making of China what it is today, one of the strongholds of the world against tyranny and aggression. So our list must include the name of Walter Judd whom we delight to honor this evening; and in honoring him we do honor to ourselves, for he is a member of our Association who has already won a distinguished place in the field of politics and statesmanship.

No apologist, therefore, is needed to defend medical men who interest themselves in politics. Laws do not operate automatically and the machinery of government will not run itself. Someone must administer the laws, someone must operate the machinery, and who should be better qualified to do those things than men who have had a scientific education, and who are trained to draw conclusions in accordance with known facts; who follow the dictum of a famous naturalist, most of whose work is now obsolete, but

who left one phrase worthy of immortality, "Let us gather some facts, in order that we may have some ideas." (de Buffon)

If further defense were necessary in order to justify medical men in taking an active interest in government and in practical politics, the testimony of a practical politician may be pertinent, for he might naturally look askance and with a jealous eye at the invasion of his field by men who are idealists and who are apt to be nonconformists, independent and intractable. Senator Burton, of Ohio, in an address before a meeting of medical men this spring advocated the establishment of a center or office in Washington, manned by men representing the best statesmanship of the medical profession, to whom members of Congress might go for wise counsel on matters pertaining to the practice of medicine and the relations of the medical profession to the public. Such advice from such a source certainly justifies the kind of representation that our Association maintains at the Capitol when the Legislature is in session.

After all, isn't an active interest in civic affairs (politics, if you please to call it by that name) of the essence of civilization? Civilization simply means being reclaimed from barbarism and acquiring the disposition to live civilly in communities, at peace with one's neighbors and respecting their rights. Civilization is not a goal which can be reached and beyond which further advancement is impossible, but it is a process of development. At its pinnacle, at any given time, is what we may call culture, implying not only learning and technical skill, but also the possession of an ideal and the habit of critically estimating the value of things. It has nothing to do with Kultur (capital K, a good word prostituted to a bad use), because the ideas of science are never put into motion by force and tyranny. Therefore, the nadir of German civilization and culture was struck, not last year, nor in 1941, but ten years ago, the tenth of May, when the government of that nation caused the burning of books with which the party then in power disagreed. Bearing in mind that lapse into barbarism, the crime of Lidice and the horrors of the Ghetto of Warsaw and holocaust of Rotterdam are understandable. But in spite of those crimes and of that recrudescence of barbarism and savagery, we can still acclaim the greatness of Goethe and Beethoven and Koch; in spite of the treachery of the Japanese at Pearl Harbor and in spite of the cold-blooded murders of helpless prisoners of war, in spite of the savage sinking of a hospital ship, which all civilized nations recognize as immune from attack, we can still accord first rank in science to men named Noguchi and Kitasato. We take pride in being able to do this, for it is a proof that we are civilized and have some degree of culture, and in our ability to do it lies the best hope of victory in the war, for barbarism has never been able to stand against the advance of civilization, nor tyranny against the will to be free.

It may appear that a comparatively trivial incident at the Capitol this spring has taken my thoughts far afield. But this trivial incident gave us an indication of the power and influence of our profession in civil affairs. The possession of that power is a sacred trust. It entails responsibility which we cannot evade. Following many illustrious examples of medical men in politics, let us accept the responsibility and utilize our power, as individuals, each in his own community, and as an organization, to advance the cause of better government at home and of civilization the world over.

POSTWAR RELIEF

In the three years following the last war more people died from famine and preventable disease than were killed in the war itself, hence the importance attached to the present organization of postwar relief. The principal regional medical officer, British Ministry of Health, holds that the lives and health of millions in Europe as well as the physique and welfare of a generation to come depend on how well this preparatory work is done. He visualizes four principal problems—the provision of food, the supply of medical necessities, the control of such diseases as typhus, malaria, tuberculosis, and dysentery, and the reëstablishment of the medical, hospital, and public health services in each country.—*Ed. Jour. Royal Inst. Pub. Health & Hyg.*, (Mar.) 1943.

THORACIC INJURIES

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CHEST injuries of serious degree, which fortunately occur relatively infrequently in civil practice, become in wartime a matter of major surgical importance. Modern all-out war strikes not only at the armed forces which are prepared to meet such conditions but all too often at civil centers hundreds of miles distant from the front and may at any time confront a city and its surgeons with numerous serious casualties of a new and unfamiliar type.

During the first World War thoracic wounds constituted 6 per cent of the eleven million casualties reported for the English, French, German and American forces. The general mortality for this whole group was 8 per cent; that from thoracic injuries alone was 56 per cent. The American Army in the first World War sustained approximately 175,000 battle injuries exclusive of those produced by gas, and of this group 2.6 per cent were thoracic injuries. The general mortality for all battle casualties was 7.73 per cent; that of thoracic injuries was 24.05 per cent. The serious nature of thoracic wounds is well illustrated by the figures quoted by Sauerbruch, in the last War, who stated that of 300 soldiers dying on the battlefield 37 per cent had chest wounds. Duval reported a 30 per cent mortality from thoracic wounds in the advanced dressing station, with 25 per cent in the ambulance and only 15 per cent in the Army hospitals.

For convenience of discussion, thoracic injuries may be divided into three general groups: (1) compression or crushing injuries; (2) closed penetrating injuries; (3) open penetrating injuries. Each of these will be discussed in turn.

There are distinct differences in the type and character of thoracic wounds as observed in civilian and war work. In civilian practice crushing injuries of the chest are seen not infrequently, as a result of automobile accidents, falls, cave-in of excavations and collapse of buildings. Penetrating wounds are usually of the closed type, as a result of a stab by a knife or an ice-pick, from a splinter of glass or wood or a bullet of small calibre from a pistol or rifle. The open penetrating type of wound is rather rare. The damage to tissue is less extensive and the condition of the patient and his clothing is such that contamination is less marked and infection follows less frequently, in only 1 to 2 per cent in some series. Conditions in this group are much more favorable for a conservative program of treatment.

War injuries on the other hand are likely to be more extensive and of greater severity. Crushing injuries from the same types of accidents occur with the addition of the devastating effects of explosive blasts. Penetrating injuries are more likely to be of the open than the closed type, from bayonet wounds, from bullets of larger calibre, from shell fragments and flying debris. The wounds themselves are frequently more extensive, tissue damage is much greater, and open pneumothorax is more common. The local conditions of the patient, clothing and the missle itself are such that contamination is infinitely greater, and retained foreign bodies, including fragments of clothing and dirt of all types, are frequently observed which encourage the subsequent infection of the part. Indications for surgical intervention are frequently observed and operation must be carried out in many of these patients as soon as their condition will permit if they are to be saved.

The following principals of treatment of thoracic injuries are fundamental and must be observed at all times. They are: (1) control of hemorrhage; (2) treatment of shock; (3) restoration of the cardio-respiratory physiology to normal as rapidly as possible.

Compression or Crushing Injuries

This type of injury may vary greatly in severity from a simple compression or squeeze without serious damage to an extremely severe crushing of the whole chest and its contents. The injury to bony structure may vary from simple fracture of one rib to multiple fractures of

Read in Symposium on Emergency Surgery at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

many or even all of the ribs, and even the sternum. The ordinary crushing injury to the chest causes a fracture of the ribs in an outward direction at the point of their greatest convexity and rarely produces lung injury from spicules for this reason. Lung injuries from fractured ribs are more likely to occur from a more localized blow which forces the rib inward fracturing it as is seen following a fall against a sharp corner or some similar injury. A severe crushing injury may be immediately fatal from rupture of the heart or great vessels by compressing them between the sternum and the spine. In less severe crushing injuries the possibility of injury to these structures may be overlooked because the chest wall springs back into place and one fails to appreciate the amount of compression which actually occurred. The shock may be slight or severe, or even of an extreme degree. Intrapleural hemorrhage may or may not occur but is a frequent complication of all types of thoracic injuries. The bleeding may be small in amount from slight injury to small vessels or may be extremely large or even fatal, the patient exsanguinating himself by bleeding continuously into the pleural cavity from an intercostal, an internal mammary or one of the larger vessels.

Traumatic spontaneous pneumothorax may not occur but is seen quite frequently if search is made for it. It may be small in amount or may be extensive. The possibilities of tension pneumothorax must be kept in mind at all times and the excess pressure relieved immediately or serious effects may follow. Tension pneumothorax alone may bring about a fatal outcome if unrelieved. Subcutaneous emphysema is frequently a painful but not a serious complication, although at times it may become rather alarming in extent. An occasional case of mediastinal leakage may not only give extensive subcutaneous swelling but may seriously embarrass the patient by compression of the soft walled vessels in the mediastinum.

Treatment

The treatment of such injuries may be briefly outlined as follows:

1. Avoid additional injury in moving the patient.

2. Shock if present must be treated thoroughly and adequately, by posture, heat, control of pain, and, if necessary, by prompt intravenous injection of serum, plasma or blood.

3. Proper position of the patient is important. If he is in shock, the head down position is imperative to avoid cerebral anemia. If shock is not present the patient with a thoracic injury is frequently much more comfortable if propped up at an angle of approximately 30 degrees. Breathing is much easier in this position.

4. If the chest wall is soft because of the injury or paradoxical breathing is occurring as in the case of multiple fractures, the chest wall must be immobilized and the paradoxical motion stopped by use of sandbags or adhesive strapping to prevent further respiratory embarrassment.

5. Pain should be controlled promptly by adequate doses of morphine, which in these injuries may require the use of a half a grain to a grain by hypo. Novocain block of the intercostal nerves of the injured segments may not only add greatly to the patient's comfort but may be followed by a prompt recovery from shock.

6. The patient must be carefully watched for intrapleural bleeding, which is of frequent occurrence. Usually the amount is small, but the bleeding may continue and the blood loss may become serious. In general the policy is to avoid aspiration early, allowing the pressure of the accumulating blood to control the bleeding if possible. Early aspiration may be followed by a recurrence of the bleeding which originally stopped spontaneously. After a few days aspiration may be done without such risk. Removal of the blood from the pleural cavity is usually advisable later to avoid thickening of the pleura and binding down of the lung with later restriction of respiratory activity. Unless there is considerable trauma to local tissue, blood which enters the pleural cavity does not clot. If necessary, this blood may be aspirated, citrated and injected into the patient's veins.

Progressive intrapleural bleeding may at times be controlled by aspiration of the blood and the establishment of a therapeutic pneumothorax, if the bleeding is coming from the injured lung itself. If the bleeding arises from an injured intercostal or internal mammary vessel such a procedure probably would be of little value. If the bleeding is progressive and its source cannot be ascertained readily, some information on the subject may be obtained by the establishment of

an artificial pneumothorax and the visualization of the interior of the chest by means of a thoracoscope. This will help to localize the site of the bleeder which may demand surgical control. If blood loss intrapleurally has been appreciable, transfusions of serum, plasma or whole blood may become necessary. Serious bleeding from an intercostal or internal mammary artery may have to be controlled surgically under local anesthesia in spite of shock if the patient is to be saved.

7. Tension pneumothorax must be borne in mind at all times and its development detected promptly. Increasing dyspnea and cyanosis, displacement of heart and mediastinum, with a tympanitic percussion note over the one side, should enable one to make the diagnosis without x-ray confirmation. Decompression of the tension pneumothorax is followed by immediate, marked improvement in the patient's condition and may be life saving. The possibilities of its recurrence after it is once relieved must be borne in mind, and facilities provided at the bedside for immediate aspiration of air if necessary or even for the introduction of an intercostal drain connected to a break-over valve to prevent the development of intrapleural pressures above atmospheric. In this connection it must be borne in mind that a pneumothorax pocket which is not embarrassing the patient may at reduced pressures as in air transport at high altitudes become a tension pneumothorax of serious degree. With the frequency of air travel and air transport of injured people, this factor must be recognized by physicians at all times.

8. Oxygen administration may be life saving in many serious thoracic injuries and should be used if available for all patients with dyspnea and cyanosis. It is well to remember, however, that oxygen administration will not compensate for, nor correct the embarrassment brought about by a tension pneumothorax.

9. If the sternum and attached rib cartilages have been depressed by a crushing injury and have not sprung back to their original position it may be necessary to elevate the sternum and depressed portion of the thoracic cage surgically by the use of traction, and to maintain it in this position by some means of fixation. Occasionally a shattered rib, particularly one which is splintered and whose ends are traumatizing the lung may have to be removed surgically before its deleterious effects can be overcome.

Closed Penetrating Wounds

Closed penetrating wounds occur most commonly from the entrance of some small object into the chest and as a rule are not accompanied by extensive damage to intrathoracic structures unless the heart or one of the great vessels happens to be injured. The patient may apparently have sustained little injury from the accident and may be in excellent condition. Except for certain specific instances this type of wound lends itself readily to conservative treatment with a very good chance of successful outcome and with a rather small risk of secondary complications. Such an attitude should in general be adopted for the handling of a majority of such cases, watching very carefully, however, for complications which may indicate surgical interference.

Treatment

1. Shock, if present, must be thoroughly treated by all means, using serum, plasma or blood if necessary.

2. Careful watch must be kept for signs of internal bleeding. If it occurs in small amounts only a conservative attitude may be justifiable. If progressive or extensive, surgical control may be mandatory.

3. Watch for cardiac tamponade. Any injury in the region of the pericardium should immediately suggest to the surgeon the possibility of injury to the heart with intrapericardial bleeding. The clinical picture of cardiac tamponade is the result of increasing pressure within the pericardium from rapid, progressive bleeding into the pericardial sac, with compression of the thin walled vessels at the base of the heart and interference with diastolic filling. The picture is quite characteristic and rather readily recognizable. The condition itself is one which if promptly recognized and adequately treated surgically may result in the saving of a number of lives which otherwise would be lost. The typical picture includes a history of injury in the region of the heart usually followed by an immediate gush of blood which may cease spontaneously. The patient may then be free of symptoms for a short period of time following which there is rapid collapse and unconsciousness. The pulse be-

comes weak, the blood pressure is low, the heart tones are very faint, the venous pressure rises high, and unless something is done to relieve the tamponade the patient may die within a short period of time. Under the fluoroscope little or no heart motion is to be observed. Aspiration of the pericardial sac may tide the patient along until the surgical setup can be completed but ordinarily one should except a recurrence of the tamponade within a short period of time. Surgical exploration of the pericardium relieves the pressure while prompt suture of the bleeding points has proven a life-saving measure in a considerable number of recorded instances.

4. Recognize and decompress tension pneumothorax. The occurrence of pneumothorax should be suspected and a careful search made for it. If it is not embarrassing the patient no active treatment may be indicated at the time. If there is any sign of tension pneumothorax, however, the pressure must be relieved either by aspiration or the institution of closed drainage, to avoid the serious consequences of an unrelieved tension pneumothorax.

5. Surgical intervention while ordinarily avoided in most closed penetrating injuries becomes necessary or even mandatory under the following conditions:

(a) To relieve cardiac tamponade.

(b) To control serious or persistent intrapleural hemorrhage.

(c) To remove a foreign body from the lung substance or the region of the great vessels. The removal of a foreign body can wait until the patient's general condition has improved sufficiently so that thoracotomy may be undertaken without undue risk.

(d) The control of continued air leakage from the torn lung. In some instances it is necessary to suture such a lung injury.

(e) To repair a laceration of the bronchus or esophagus. Such injuries are particularly dangerous because of the contamination which attends them. Surgical repair should be undertaken early, not only to prevent further contamination but also to control air leakage and the tension pneumothorax or emphysema which may follow.

The results of the treatment of closed penetrating injuries are quite satisfactory if a conservative attitude is adopted and surgical intervention limited to specific indications.

Open Penetrating Wounds

Open penetrating wounds of the thoracic cage in both civilian and war work are of major importance and potentially very dangerous to the patient. They not only represent serious damage to the chest wall and intrathoracic organs but induce grave secondary symptoms by seriously disturbing respiration and cardiac action, and present great possibilities of serious infection subsequently. Because of the nature of the wound, its extent, and the secondary effects produced, they are frequently accompanied by marked shock, and present conditions which if not immediately relieved may lead to a prompt fatal outcome. They require prompt emergency treatment to control hemorrhage, to overcome shock and to rapidly return the cardiorespiratory system to normal or thereabouts as rapidly as possible. Any delay in administering emergency treatment may mean the loss of the patient. There are four points in the emergency management of these injuries which may well prove life saving:

1. Control of hemorrhage. If possible all bleeding points must be controlled by clamping, ligature, suture or packing.

2. A sucking chest wound must be closed promptly, by any means at hand. If sterile gauze is available it may be packed tightly and sealed by adhesive or temporary suture, but some method must be devised to stop the external suction, for if the opening is of much size the patient will not long survive a sucking wound. Plastic closure of the opening must await a more favorable time.

3. Adequate doses of morphine, at least a half to one grain, must be given to relieve pain and dyspnea. A patient with an open sucking wound develops marked dyspnea with a struggling type of respiration which merely tends to exaggerate this respiratory difficulty. The slow, quiet breathing which the patient has under morphine narcosis may permit adequate ventilation without inducing the mediastinal turmoil which attends a struggling type of respiration.

4. Proper measures must be taken for the treatment of shock, which in these cases is likely to be severe. Prompt administration of serum, plasma or blood intravenously is indicated even at the scene of the accident, and oftentimes should be done before any attempt is made to transport the patient. Relief of pain, application

of external heat, closure of an open sucking wound, and the other standard measures used in the treatment of shock are all indicated.

5. Local implantation of chemotherapeutic agents into the wound should be considered as there is a high incidence of contamination and subsequent infection in open penetrating wounds. The local use of sulfanilamide, sulfathiazole or both into the wound at the scene of the accident may be of value, but caution must be observed as the absorption of any chemical agent from the pleural cavity is rapid, and doses in excess of from five to eight grams may prove toxic.

6. Transportation. After the above measures have been applied the patient must be moved to the hospital where more adequate treatment may be administered, protecting him against all additional trauma during the course of such transportation. Here as in other cases involving pneumothorax it is well to remember the effect of higher altitudes on pneumothorax pockets, particularly in patients with a limited respiratory reserve, and to take proper precautions to prevent the development of a tension pneumothorax. Needless to say, the most rapid means of transportation to the hospital where adequate surgical facilities are available is to be recommended, all of the points taken into consideration.

7. Oxygen administration is frequently advisable and may be life-saving in its effect. However, it must be used intelligently, and the fact that it will not relieve all respiratory difficulties must be recognized.

8. When and if the patient can be transported to a hospital with adequate surgical facilities and his condition becomes satisfactory to permit thoracotomy, the lacerated wound should be excised, a thorough débridement performed, foreign bodies removed from lungs and pleural cavity and closure of the chest wall performed. In some instances the lung will be so damaged that partial or complete lobectomy probably by a tourniquet technique with mass ligation will be necessary.

9. Plastic closure. The surgical problem of closure of a chest wall defect may at times be complicated, depending upon the amount of soft tissue and chest wall which was damaged in the original accident. If at times a portion of the chest wall must be excised because of being shattered or the tissues destroyed it may be necessary to transplant the pectoralis major or latissimus dorsi muscle to close the defect with partial transplantation of one or more ribs in order to stabilize the soft spot left in the chest wall. An airtight closure must be provided to avoid the injurious effects of a sucking wound. The possibility of some such plastic closure must be kept in mind when an incision is made to open the chest cavity in case of an injury and care taken to preserve all structures which may be of value in reconstructing the chest wall.

10. Because of the prompt occurrence of a pleural effusion following intrathoracic injury and manipulation, some type of drainage, preferably of the closed type, must be instituted at the completion of the operation, for large effusions are likely to form and tension from them must be relieved promptly. This is more readily accomplished by closed drainage than by repeated aspiration and with less discomfort to the patient. Likewise, the closed drainage tube with constant negative pressure postoperatively will be of value in obtaining expansion of the remaining portions of the lung, more rapid obliteration of the pleural cavity and providing drainage for the empyema which not infrequently follows such an injury.

All open penetrating wounds of the chest are extremely serious injuries, and potentially very dangerous to the life of the patient. Some simple emergency surgical measures may be life-saving and tide the patient along to the time when more radical intrathoracic surgery may be performed to save the patient from an injury which under ordinary circumstances would be inevitably fatal. The man doing general surgery must be educated concerning the physiology of respiration and the mechanisms in play in any intrathoracic trauma. To the general surgeon, even in war work, must fall the task of the emergency treatment of these injuries and upon his knowledge and skill may depend the life of a patient who has sustained such a serious injury.

ABDOMINAL INJURIES

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THE abdominal cavity, considering the importance of the organs situated therein, is probably the least protected and consequently the most easily injured of all body cavities.

Because of their usual complexity, the multiplicity of organs involved, the frequent association of other severe injuries, and commonly the presence of shock, injuries of the abdomen offer difficult diagnostic as well as therapeutic problems and are frequently associated with serious complications which entail a high mortality rate.

Nonpenetrating blunt force, or penetrating, wounds of the abdomen always carry the potential dangers of serious hemorrhage and peritonitis. These two complications and the frequent association of shock are the ones which so seriously imperil life.

Since shock is present in about 33 per cent of cases of abdominal injuries, and since 50 per cent of those in shock die, one can readily appreciate how important it is to distinguish early between shock without severe hemorrhage and shock following severe bleeding, and to institute early the proper supportive therapy, whether it be the use of whole blood, serum or plasma, until such time as a decision can be made whether the injured shall be treated by conservative measures or by operation.

An abdominal injury is a serious condition whether it occurs in civilian life or in war. In civil life, the automobile is the implement most frequently involved. In war, quoting Storck, "The general category of gunshot wounds of the abdomen, includes not only injuries due to bullets fired from rifles, revolvers or machine guns, but those wounds peculiar to warfare which are caused by fragments of shells, bombs and hand grenades, as well as the blast injuries produced by detonation of high explosives." I might emphasize that in total war these wounds are not confined to the military but occur to the civilian as well—men, women and children. According to Gordon-Taylor, in the present war, in one series of abdominal cases, 78 per cent were men, 20 per cent women and 2 per cent children.

These injuries were produced not alone by projectiles from rifle, machine gun and bomb, but also by flying missles of metal, splinters of wood and glass, falls, falling masonry, and blast concussion.

The gravity of the abdominal injuries of the present war is attested by the statement of Gordon-Taylor when he stated, "Only 50 per cent of the patients with an abdominal injury, for whom operation is possible, survive."

Abdominal injuries in civil life are also associated with a high mortality. Such is the case largely because of the frequency of associated multiple injuries which are inevitably and rapidly fatal.

Clinically, according to Estes, abdominal trauma may be classified into three groups: (1) severe multiple injuries which are rapidly fatal and for which no treatment is of avail; (2) cases that obviously require immediate operation; (3) cases in which the diagnosis is doubtful and the indications for or against operation are not clear.

In the first category fall most transportation accidents, the automobile being the most frequent causative factor.

In the second and least common group, those requiring immediate operation, occur most penetrating injuries, of which the commonest are gunshot wounds.

In the third or final group fall most of those due to blunt force, therefore nonpenetrating. They are most commonly due to blows or falls.

There were 2,483 accidental deaths, suicides and homicides in Minnesota during the year 1941. Of these, there were 787 transportation accidents, of which those due to the automobile made up the largest number. There were 570 deaths from falls and fifty-one from firearms. These three modes of accidental deaths, suicides and homicides comprised over 50 per cent of the total.

Thus we can predict that automobile accidents, blows, falls, and gunshot wounds will be the most frequent causes of abdominal injuries.

An analysis of the abdominal injuries occur-

From the Department of Surgery, The Duluth Clinic, Duluth, Minnesota. Read in Symposium on Emergency Surgery before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

ring in the decade 1930-1940, admitted to St. Mary's and St. Luke's Hospitals was undertaken.

During this time there were eighty-five abdominal injuries; sixty-five of these occurred in males and twenty in females (Table I).

TABLE I. AGE INCIDENCE

1930-1940

Males (average age 30)	65
Females (average age 31)	20
Total	85

Motor vehicle accidents comprised 35 per cent, accidental falls and blows 35 per cent, gunshot and stab wounds 15 per cent and miscellaneous accidents 15 per cent (Table II).

TABLE II. CAUSES OF INJURY

Motor vehicle accidents	30
Accidental falls	17
Blows	12
Firearms	6
Suicide with firearms	3
Stab or puncture wounds	3
Railroad accidents	2
Miscellaneous	12
Total	85

In forty-five or slightly more than 50 per cent, the abdominal wall alone was injured. In the group of intra-abdominal traumas, there were frequently multiple injuries, the liver being the most commonly injured, the kidney second. Other less frequent injuries were lacerations of the intestine, retroperitoneal hemorrhage, injuries to the spleen, et cetera (Table III).

TABLE III. AREAS AFFECTED

Abdominal wall	45
Liver	11
Kidney	8
Spleen	3
Intestines	5
Mesentery	2
Retroperitoneal hemorrhage	5
Ruptured bladder	1
Traumatic appendicitis	1
Miscellaneous	4
Total	85

Associated injuries occurred in forty-three or 50 per cent of the cases (Table IV). Of these twenty-four were considered of a minor and nineteen of a major character. Of the major associated injuries six involved the thorax and in sixteen there were associated fractures of the extremities, pelvis, skull, spine or the thoracic cage.

TABLE IV. ASSOCIATED INJURIES

Abdominal injuries total	85
Associated injuries (50%)	43
Minor	24
Major	19
Thorax	6
Fractures	16

There were twenty-two deaths (Table V). The chief cause of death in the autopsied group was hemorrhage and the next most frequent cause was peritonitis.

TABLE V. MORTALITY

Deaths (25%)	22
Autopsies	17
Causes of death	
Hemorrhage	10
Peritonitis	5
Atelectasis and bronchopneumonia	1
Arteriovenous aneurysm	1

Sixty-two were treated conservatively, with sixteen deaths, or a mortality of 25 per cent (Table VI). In the operative group there were twenty-three patients so treated, with six deaths, or 25 per cent.

TABLE VI. MORTALITY FOLLOWING TREATMENT AND SHOCK

Nonoperative treatment	62
Deaths (25%)	16
Operative treatment	23
Deaths (25%)	6
In shock	30
Deaths (50%)	16

Half of the injured who were in shock died.

In the penetrating wounds of the abdomen, there were six deaths, or 33 per cent, while in the nonpenetrating injuries there were sixteen deaths, or a mortality of 25 per cent (Table VII).

TABLE VII. MORTALITY ACCORDING TO TYPE OF WOUND

Penetrating wounds	18
Deaths (33%)	6
Nonpenetrating wounds	67
Deaths (25%)	16

Summary

1. A series of patients with abdominal injuries admitted to St. Mary's and St. Luke's Hospitals in the decade 1930-1940 was analyzed.

2. The young adult male is the most frequently injured.

3. The automobile, falls, blows and gunshot wounds are the most frequent causative agents in civilian life.

4. In about 50 per cent of injuries the abdominal wall alone is traumatized. Intra-abdominal injuries frequently are multiple, the liver being the most commonly injured.

5. Associated injuries occur in about 50 per cent of cases.

6. In this series, there was a 25 per cent mortality rate, alike in those treated conservatively and those subjected to operation. Fifty per cent of all patients in shock died.

7. Penetrating wounds were associated with a mortality of 33 per cent compared to 25 per cent in the nonpenetrating injuries.

8. The mortality for the entire series was approximately 25 per cent. The most common causes of death in the autopsied group were hemorrhage and peritonitis.

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SHOCK, ITS CAUSE AND TREATMENT

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IT is easier to describe and treat shock than it is to define it. Shock is a symptom-complex characterized by weakness, pallor, rapid pulse, sweating, low blood pressure, and loss of degrees of consciousness. If progressive and untreated, it leads to death. Something happens that allows increased cellular permeability, hemo-concentration, reduced blood volume, reduced blood flow, with a resultant tissue anoxia and damage.

Shock may be either primary or secondary. Goltz described primary shock in 1865, which he showed to be a purely reflex mechanism, the sudden drop in blood pressure being due to a reflex vasodilatation. This type of shock occurs following the use of spinal anesthetics, in operations on the brain or spinal cord, from unpleasant sensory experiences, and in operations in which there is pulling on the mesentery or peritoneum. In most instances the shock is only temporary and responds to vasoconstricting drugs or to lowering the head of the patient as in the Trendelenburg position. Secondary shock is probably due to a combination of several factors and the initiating factor is still debatable. The time factor and the intensity of the shocking procedure are important in determining whether the shock is primary or secondary. Gross, in 1872, believed that the decrease in blood volume was important in secondary shock. This clinical observation has been supported by the work of Mann, Erlanger, Porter and others. Just how this reduction occurs has been the subject of much investigation.

Several investigators have supported the hypothesis of vasoconstriction as bringing about the reduction of blood volume. However, as Blalock has pointed out, no one has produced shock by causing uncomplicated vasoconstriction, and vasoconstriction is probably an accompanying and contributing factor rather than an irritating one in causing the reduction of blood volume.

Some have believed that a toxin liberated in the injured tissues causes capillary dilatation with an increase of permeability and subsequent loss of fluid. Cannon and Bayliss placed a tourniquet around a limb of a cat and then traumatized the muscles. The animal remained normal as long as the tourniquet was in place, but when it was

From the Department of Surgery, University of Minnesota Medical School, Minneapolis, Minnesota. Read in Symposium on Emergency Surgery before the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, July 1, 1942.

removed the animal rapidly went into shock. It was thought that a toxin was liberated from the damaged tissues which was taken up into the circulation when the tourniquet was removed which caused generalized capillary dilatation, increased permeability of the vessels, a generalized loss of fluid with a subsequent oligemia. This experimental work coincided with the clinical observations made during the first World War. It was noticed that soldiers brought into hospitals with a tourniquet on an injured extremity rapidly went into shock when the tourniquet was removed. Dale and Laidlaw showed there was a similarity between shock caused by the intravenous injection of histamine and traumatic shock.

Up to 1930, the idea that a toxin was the cause of shock was generally accepted. About this time, however, Blalock and Parsons and Phemister showed that in the cat-limb experiment of Cannon and Bayliss, enough fluid was lost locally into the thigh and pelvis as a result of the trauma to account for the decrease in blood volume. It was shown when the femoral artery was excluded from the tourniquet and the limb traumatized, the animal still went into shock even though there was no avenue of escape of the toxic products. Perfusion experiments with blood from traumatized regions have failed to elicit any evidence for the presence of vasodilator substances in the tissues. Numerous investigations have repeatedly shown that histamine is not the sole causative agent in traumatic shock. Dragstedt and Mead were unable to detect any histamine in the blood or lymph of animals dying of traumatic shock; yet when sufficient histamine had been given to cause death from histamine poisoning, this substance was easily detectable. Dale has shown that the shock that followed the Bayliss-Cannon limb-trauma experiment was not histamine poisoning.

There is a definite relation between the local loss of fluid and the reduction of the blood volume present in traumatic shock. Harkins has shown that the average amount of plasma that must be removed to produce death is 4 per cent of the body weight.

Nervous factors are important in the etiology of shock. It is well known that rough handling of tissues, unskillful manipulation, faulty immobilization of fractures, fatigue, cold, fear, and pain all increase shock. Crile believed that shock was due to excessive painful stimulation which brought about exhaustion of the vasomotor centers. Some of the best work of the problems of the nervous factors of shock was done by O'Shaughnessy and Slome of England. They found that the time it took for an animal to die following fracture and trauma of an extremity was not closely correlated with the amount of plasma lost. O'Shaughnessy felt that there was an important nervous factor in traumatic shock. In the critical experiment carried out by O'Shaughnessy, the hind leg of an animal was isolated, the circulation was cut off, but the nerve trunks remained intact. In order to maintain the irritability of the nerves the experimental animal was perfused by a second animal; therefore, when trauma resulted in shock, it could only be through nerve impulses. O'Shaughnessy's experiment has been successfully repeated by Kabat.

It might be thought that anesthesia should lessen or actually prevent shock due to nerve impulses; however, recent experiments have shown that nerve impulses actually reach the sensory cortex in general anesthesia. They do not reach the brain with local or spinal anesthesia. In shock due to trauma, the deeper the anesthetic the more severe the shock. An interesting experiment concerning the relationship of nervous impulses and fluid loss in shock is the following: If one determines how much blood an animal can lose before going into shock and then lets the animal recover; if a femur is fractured and the edges of the fractured bones rubbed together, the animal will go into shock when a much less quantity of blood has been lost. It is well known experimentally and clinically that if one injects local anesthesia at the side of the fracture, the incidence of shock is much lower.

From the above discussion, it is seen that the loss of blood volume and also nervous impulses play an important role in surgical shock. The nervous factor is especially important in some types of traumatic shock, as in the fracture of the long bones. Recently it has been shown that the effect of the afferent nerve impulses appear to be quite definite in intensifying fluid loss in burns.

Treatment of Shock

The best way to treat shock is to try to prevent it by getting the patient in the best possible condition for operation, care in the selection of anesthesia, avoiding trauma to the tissues during

the surgical procedure, etc. If the shock is primary in nature, as for instance after hearing some bad news, or immediately following the administration of a spinal anesthetic, etc., all that one has to do is to lower the head and wait a few minutes, and in cases of mild shock this is all that is necessary. In regard to spinal anesthesia, if a patient goes into severe shock, vasoconstricting drugs do not do much good. Vasoconstricting drugs, as ephedrine, are most effective when given at the time the anesthetic is administered. After the patient has gone into shock from a spinal anesthetic one usually has to give intravenous fluids to overcome the shock. Occasionally, one sees shock in patients brought back to the ward after an operation in which cyclopropane has been used. This is usually a temporary affair and the blood pressure quickly rises when the patient is put into Trendelenburg position.

The question as to when we consider a patient is in shock is best considered here. The best criterion is the blood pressure. Certainly when the systolic pressure registers 100 mm. of mercury the patient is imminently in danger of going into shock; when the pressure falls to 80 mm. of mercury the patient is definitely in shock and when it falls to 60 mm. or lower the patient's condition is critical. In treating shock it is important to try to get rid of the cause if possible, that is, stopping the source of bleeding, correcting improper splinting, etc. The patient should be kept quiet and warm, with the head lower than the rest of the body. Adequate amounts of sedation should be given, but most important of all the reduced circulating blood volume must be corrected. The intravenous administration of whole blood is the best treatment in case of shock due to hemorrhage; next best are blood plasma or serum. If these are not immediately available, an intravenous injection of a 5 per cent acacia solution or physiologic saline may be given temporarily.

One hears nowadays the term serum and plasma used interchangeably. While physiologically these substances are different, they have the same value where a safe, physiological solution of serum proteins is indicated. Plasma has the disadvantage of containing a fibrin veil which must be removed by filtration before use. The presence of unprecipitated fibrinogen is always a potential source of further fibrin-veil formation. Plasma also contains citrate and saline solutions which dilute the effective therapeutic agent and may in themselves cause reactions. Serum has none of these drawbacks and is rapidly gaining favor as an infusion fluid. This has been especially true in wartime England where the high incidence of bacterial contamination and the necessity of filtration has thrown the use of plasma into disfavor. It is especially urged that great care be taken in hospitals where plasma is redeemed as a by-product of a blood bank. In this instance, the lack of proper checks on sterility, the excessive hemoglobin content due to hemolysis, the absence of proper pooling, the increased potassium level due to hemolysis, and the dangers from improper filtration have already led to catastrophes (Dwan).

The question arises, "How much blood does one have to give to a patient in shock?" One has to give enough blood until the patient's blood pressure rises to over 100 mm. of mercury and his general condition is improved. On several occasions the continuous transfusion of more than four or five quarts of pooled Group 0 blood has been necessary to bring a patient out of severe shock. Plasma and serum of course have the advantage of not having to be cross-matched with the patient 's blood. At the present time, nearly all the larger hospitals have blood banks and commercial plasma or serum is available to all smaller hospitals. As to the use of drugs, most of them are of questionable value in the treatment of shock. Adrenalin, caffein, sodium benzoate, coramine, metrazol are poor substitutes for transfusion with blood or blood substitutes in severe shock. Cortical adrenal extract may be of some value in preventing shock in burns, but certainly its prophylactic use and its use in severe shock is of questionable value in most surgical operations. Concerning the changes of the hemoglobin level, erythrocyte count, the hematocrite reading, the plasma specific gravity, or the blood potassium, these are of value in determining that shock is present. However, the blood pressure gives the earliest, simplest, and most accurate indication of impending shock.

Definition of Shock

This heading should logically appear at the first of the paper but, as it has been said, it is easier to describe and treat shock than it is to define it. Harkins has summed up the present-day understanding of the physiology of shock by describing it as "progressive vasoconstrictive oli-

gemic anoxia." A simpler definition of shock is the following: Shock is a symptom-complex resulting from a decrease in the circulating blood volume essential for the maintenance of the proper functioning of the heart and higher nerve centers. This would seem to give a satisfactory physiological explanation of the condition without entering into the more controversial aspects. It emphasizes the importance of correcting the reduction of blood volume and blood flow in order to prevent resultant tissue anoxia and damage.

Summary

The shock may be defined as a symptom-complex caused by a reduction in the effective blood volume essential for the maintenance of the heart and higher centers. Clinically, it is characterized by pallor, weakness, sweating, loss of degrees of consciousness, low blood pressure, and a rapid pulse. The importance of nervous factors in the cause of shock as well as the decreased blood volume has been emphasized. The earliest and most important sign of impending shock is a falling blood pressure. The present-day methods of treatment of shock have been reviewed.

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TREATMENT OF BURNS

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BURNS have always been a serious problem in civil life, but now the accidents of wartime have greatly increased their importance. In wartime, the treatment of burns presents a problem differing from that during peacetime. As Penfield stated, "What is needed, is not a council of perfection in the treatment of burns; what is needed is standardized simple methods which could be used by a man in a dressing station, who has five or fifty burns to treat at once, methods that can be used in hospitals that might have to treat hundreds of them."

Treatment of burns is a threefold problem: (1) general treatment of the patient; (2) local treatment of the burn; (3) reconstruction and preservation of function of the parts involved.

In determining the severity of a burn it is of first importance to estimate the body surface involved. This is best done by the method of Berkow[3] as follows:

	Per cent
1. Lower extremities including buttocks Foot 1/6; leg 2/6; thigh 3/6	38
2. Trunk Anterior surface 20% Posterior surface 18%	38
3. Upper extremities Hand ¼; arm ¾	18
4. Head	6

In children under twelve the proportions are varied as follows:

Trunk	40
Upper extremities	16
Head (subtract the age in years from twelve and add the result to the adult figure)	6
Lower extremities (subtract the age in years from twelve and subtract this figure from the adult figure)	38

There is a great difference in the reaction of individuals to burns so that any comparison of cases is difficult.

All burns covering more than one-tenth of the

Read in the Symposium on Emergency Surgery at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 30, 1942.

body surface should be considered serious and those covering more than one-third of the body surface are often fatal. Burns of the anterior thorax, abdomen, genitalia and perineum cause symptoms far out of proportion to the surface area involved.

It is often difficult and of no great importance to determine the depth of the burn on the initial inspection. Often a burn which appears to be largely first and second degree may, after a few days, show definite evidence of a deeper or third degree burn.

Since current reports indicate that 60 to 80 per cent of deaths from burns are due to secondary shock, herein lies the greatest opportunity to lower the mortality rate in these cases. Most delayed fatalities are due to sepsis.

If the patient is not near a place where definitive treatment can be carried out, the local first aid treatment should consist only of cutting away the clothing from the part involved and covering the burned area with a sterile dressing. As soon as the patient arrives at a place where treatment for shock can be carried out, this should be done. No local treatment should be started until adequate treatment of shock has been carried out. This consists of relief of pain by large doses of sedatives or morphine (½ grain in an adult), elevation of the foot of the bed and prevention of heat loss. Application of excessive external heat may increase the shock due to the opening up of peripheral vessels with a resultant diminution of availability of blood for vital centers. It has been clearly demonstrated that there is extensive local loss of fluids in burns. Experimentally, a burn of one-sixth of the body surface area can cause a fluid loss of 70 per cent of the total blood volume in twenty-four hours.[11] Over half the plasma loss may occur within one hour of the burn. There is a continued loss of plasma for some time after the burn and the local edema reaches its peak in about twenty-four hours. This fluid loss causes a hemoconcentration and thus increased viscosity of the blood, slowing of the circulation time, decreased oxygen carrying efficiency of the blood and tissue anoxemia, resulting in eventual respiratory and circulatory failure.

The amount of fluid loss from the circulating blood volume may be estimated by hematocrit study and, if possible, the plasma should be given quantitatively.

Harkins[5] has advocated giving 50 c.c of plasma for every per cent of the body surface affected by a deep (blistering) burn. The formula roughly gives the entire amount of plasma that will be necessary; this amount to be given, one-third the first two hours, one-third the next four hours and one-third the next six hours.

An alternative formula for estimating the amount of plasma required (Harkins[5]) is to administer 100 c.c. of plasma for every point the hematocrit reading exceeds the normal of 45.

Saline and dextrose may increase the perivascular edema by further washing out the plasma proteins which are required to keep such solutions in the vessels.[4]

Because of the abnormal capillary permeability in burn cases during the first two days, plasma transfusions may fail to maintain the plasma volume level. Adrenal cortical extract has been shown to decrease capillary permeability and should be given together with adequate plasma transfusions in these cases.[9] Five to 10 c.c. every six hours should be given to adults and a proportionate dose to children. Because of marked chloride retention occurring in these patients receiving adrenal cortical extract the administration of saline should be limited.

In severe burns administration of oxygen may be of value to combat the tissue anoxia as the result of slowed circulation time.[12]

No matter what the local treatment used in a burn case certain fundamental principles should be followed in all cases. At all times burns should be considered to be open surgical wounds and sterile technique is essential. Caps and masks and sterile gowns and gloves should be worn by those dressing burns, since contamination from the nose and mouth may readily convert a clean wound into a contaminated wound. Sterile bed linen should be used in all cases.

In all types of treatment preliminary débridement of the burn should be limited to opening of the blebs, removal of skin fragments, and gentle cleansing with cotton balls, soap and water, followed by thorough rinsing with saline. Vigorous scrubbing, necessitating anesthesia for its performance, is inadvisable. The trauma of such a procedure increases shock, and the possibility of increasing liver damage should always be considered in these cases.

Since the advent of sulfonamids, the local treatment of burns has been in a state of flux.

Tannic acid has been perhaps the most widely

used treatment during the past few years. It has been applied as a solution (5 to 20 per cent) in the form of sprays, packs or baths, and as a jelly or paste. It has been used in conjunction with 10 per cent silver nitrate to cause a more rapid tan and decrease infection. Several objections have been raised to this method.

1. It destroys epithelial cells that would be of value in the regeneration of epithelium over the burn and thus delays healing.
2. It should not be used on the hands because the constriction of the tan about the fingers may cause ischemic necrosis.
3. It is unsatisfactory on the face, axilla, groin and perineum.
4. In third degree burns skin grafting is delayed. Infection usually develops under the crust and the tan separates slowly or must be excised.

Gentian violet, 1 or 2 per cent as a spray, forms a thin eschar and reduces infection due to gram positive organisms.[1] Using the triple dye (gentian violet 2 per cent, brilliant green 1 per cent, and neutral acriflavin 0.75 per cent) the growth of both gram positive and gram negative organisms is reduced.

The sulfonamids have been used in the form of solutions, ointments, pastes and powders, and have been effective against infection. Three per cent sulfadiazine in a solution of 8 per cent triethanolamine used as a spray has given excellent results (Pickrell[8]). It forms a thin translucent eschar that is strong, pliable and elastic enough to permit motion. The treatment is particularly useful in burns of the face, since the solution can be used in and around the eyes with impunity. When using any sulfonamids on large burned areas, the blood sulfonamid level should be followed, because of the absorption from the surface of the burn.

The use of sulfathiazol and urea in ointment form offers considerable promise because it has been shown that the urea action rids the wound of necrotic tissue and sulfonamid inhibitors, allowing the sulfonamid component present to exert a maximum bacteriostatic action.[6,10]

The Koch method of treatment of burns, converting the open contaminated wound into a clean wound by thorough cleansing, then applying a pressure dressing over a layer of petrolatum gauze, has many advantages.[2] It places the part at rest, decreases further fluid loss, does not destroy remaining epithelial elements, and thus does not delay healing.

The National Research Council Committee on Burns[7] has advocated the use of 10 per cent tannic acid and 10 per cent silver nitrate in spray form after débridement of the wound. On the face, axilla, groin and perineum, ointments are recommended.

Reconstruction

Extensive burns of third degree always will require covering by skin-grafting to prevent scarring and contractures. Any granulation surface of more than two to three square inches should be grafted in order to hasten convalescence. There are still many cases of burns which are allowed to heal by granulation with its subsequent keloid and fibrous tissue formation. When third degree burns are about joints, marked limitation of function will result. In these cases, especially, early skin-grafting makes all the difference between success and failure. Early resurfacing of granulating surfaces shortens the period of convalescence, prevents functional incapacitation and disfiguring scars.

The surface in third degree burns should be prepared by the use of saline dressings and compression. A layer of sterile old linen is placed next to the denuded area to prevent pain in changing dressings. Over this is wrapped a wet gauze roll. This dressing is kept moist with saline and changed daily. When the surface is free from gross pus and the granulation base is firm —not too exuberant and watery—and is cherry red in color, the area should be covered by a large graft of intermediate thickness. Sulfonamid powder may be placed over the granulations before applying the graft to decrease the possibility of infection. This does not interfere with healing of the graft. The graft is held in place by the same type of wet dressing and is left undisturbed for four or five days. Any motion of the part grafted should be limited by suitable splinting.

A careful follow-up should be considered part of the treatment of every burn case. Contractures, which might be prevented by proper splinting, may develop. Keloid formation may be limited or reduced by subsequent x-ray therapy. Disabling cracks and fissures may develop in scars on the backs of the hands.[12,13]

Summary

1. Sixty to eighty per cent of deaths from burns are due to secondary shock.

2. Shock should be treated by: (a) plasma transfusions to correct hemoconcentration, (b) adrenal cortical extract to decrease capillary permeability, (c) oxygen to relieve tissue anoxia.

3. All burns must be considered to be open surgical wounds and treated using sterile technique.

4. Early resurfacing of granulating surfaces will shorten the convalescence and preserve function of the parts involved.

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MANAGEMENT OF FRACTURES UNDER WAR CONDITIONS

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THE majority of the patients herein considered suffered fractures from enemy action due to air raids. A few were injured while on mine sweepers or on boats in the harbor which struck mines, and also suffered from immersion shock as a result of being in water for a period of time. The problem of the management of the fractures will be considered in two phases. The first phase includes the care of the patient from the time of the injury to admission to the hospital, and the second phase concerns hospital treatment.

Care of the Patient Before Hospitalization

Most of the patients received injuries from falling buildings and suffered a fracture of an extremity either from flying debris or being buried under brick, stone, or timber. Some of the patients were buried for a period of four or five hours while others, of course, were buried for only a few minutes and some were merely struck by a flying object and knocked down.

As the patients were picked up by the stretcher-bearers they were hastily but carefully examined for any gross injuries such as compound fractures, dislocations, or large lacerations. Those patients who had severe fractures or dislocations were immediately splinted, placed on a stretcher and carried to a waiting ambulance. If there were any open wounds, sterile dressings were applied before application of the splint. As a rule, sulfanilamide was not dumped into the wound. The ambulance then conveyed the patient to a nearby casualty clearing station where preliminary care was given. Very few patients ever required the use of a tourniquet. The use of a tourniquet in war zones undergoing air raids is dangerous unless a trained person can remain with the patient. Many times ambulance trips are interrupted, and the patient may have a tourniquet on four or five hours instead of thirty or sixty minutes as was originally planned. Most hemorrhage can be stopped by direct pressure. Therefore, unless absolutely indicated, the application of a tourniquet is dangerous.

When the patient arrived at the casualty clearing station he was checked over by a physician and a note of his injuries was made and placed on a card which was suspended from the patient's neck by a string. Thus, a patient having suffered a fractured leg had this information

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used treatment during the past few years. It has been applied as a solution (5 to 20 per cent) in the form of sprays, packs or baths, and as a jelly or paste. It has been used in conjunction with 10 per cent silver nitrate to cause a more rapid tan and decrease infection. Several objections have been raised to this method.

1. It destroys epithelial cells that would be of value in the regeneration of epithelium over the burn and thus delays healing.
2. It should not be used on the hands because the constriction of the tan about the fingers may cause ischemic necrosis.
3. It is unsatisfactory on the face, axilla, groin and perineum.
4. In third degree burns skin grafting is delayed. Infection usually develops under the crust and the tan separates slowly or must be excised.

Gentian violet, 1 or 2 per cent as a spray, forms a thin eschar and reduces infection due to gram positive organisms.[1] Using the triple dye (gentian violet 2 per cent, brilliant green 1 per cent, and neutral acriflavin 0.75 per cent) the growth of both gram positive and gram negative organisms is reduced.

The sulfonamids have been used in the form of solutions, ointments, pastes and powders, and have been effective against infection. Three per cent sulfadiazine in a solution of 8 per cent triethanolamine used as a spray has given excellent results (Pickrell[8]). It forms a thin translucent eschar that is strong, pliable and elastic enough to permit motion. The treatment is particularly useful in burns of the face, since the solution can be used in and around the eyes with impunity. When using any sulfonamids on large burned areas, the blood sulfonamid level should be followed, because of the absorption from the surface of the burn.

The use of sulfathiazol and urea in ointment form offers considerable promise because it has been shown that the urea action rids the wound of necrotic tissue and sulfonamid inhibitors, allowing the sulfonamid component present to exert a maximum bacteriostatic action.[6,10]

The Koch method of treatment of burns, converting the open contaminated wound into a clean wound by thorough cleansing, then applying a pressure dressing over a layer of petrolatum gauze, has many advantages.[2] It places the part at rest, decreases further fluid loss, does not destroy remaining epithelial elements, and thus does not delay healing.

The National Research Council Committee on Burns[7] has advocated the use of 10 per cent tannic acid and 10 per cent silver nitrate in spray form after débridement of the wound. On the face, axilla, groin and perineum, ointments are recommended.

Reconstruction

Extensive burns of third degree always will require covering by skin-grafting to prevent scarring and contractures. Any granulation surface of more than two to three square inches should be grafted in order to hasten convalescence. There are still many cases of burns which are allowed to heal by granulation with its subsequent keloid and fibrous tissue formation. When third degree burns are about joints, marked limitation of function will result. In these cases, especially, early skin-grafting makes all the difference between success and failure. Early resurfacing of granulating surfaces shortens the period of convalescence, prevents functional incapacitation and disfiguring scars.

The surface in third degree burns should be prepared by the use of saline dressings and compression. A layer of sterile old linen is placed next to the denuded area to prevent pain in changing dressings. Over this is wrapped a wet gauze roll. This dressing is kept moist with saline and changed daily. When the surface is free from gross pus and the granulation base is firm —not too exuberant and watery—and is cherry red in color, the area should be covered by a large graft of intermediate thickness. Sulfonamid powder may be placed over the granulations before applying the graft to decrease the possibility of infection. This does not interfere with healing of the graft. The graft is held in place by the same type of wet dressing and is left undisturbed for four or five days. Any motion of the part grafted should be limited by suitable splinting.

A careful follow-up should be considered part of the treatment of every burn case. Contractures, which might be prevented by proper splinting, may develop. Keloid formation may be limited or reduced by subsequent x-ray therapy. Disabling cracks and fissures may develop in scars on the backs of the hands.[12,13]

Summary

1. Sixty to eighty per cent of deaths from burns are due to secondary shock.

2. Shock should be treated by: (a) plasma transfusions to correct hemoconcentration, (b) adrenal cortical extract to decrease capillary permeability, (c) oxygen to relieve tissue anoxia.

3. All burns must be considered to be open surgical wounds and treated using sterile technique.

4. Early resurfacing of granulating surfaces will shorten the convalescence and preserve function of the parts involved.

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MANAGEMENT OF FRACTURES UNDER WAR CONDITIONS

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THE majority of the patients herein considered suffered fractures from enemy action due to air raids. A few were injured while on mine sweepers or on boats in the harbor which struck mines, and also suffered from immersion shock as a result of being in water for a period of time. The problem of the management of the fractures will be considered in two phases. The first phase includes the care of the patient from the time of the injury to admission to the hospital, and the second phase concerns hospital treatment.

Care of the Patient Before Hospitalization

Most of the patients received injuries from falling buildings and suffered a fracture of an extremity either from flying debris or being buried under brick, stone, or timber. Some of the patients were buried for a period of four or five hours while others, of course, were buried for only a few minutes and some were merely struck by a flying object and knocked down.

As the patients were picked up by the stretcher-bearers they were hastily but carefully examined for any gross injuries such as compound fractures, dislocations, or large lacerations. Those patients who had severe fractures or dislocations were immediately splinted, placed on a stretcher and carried to a waiting ambulance. If there were any open wounds, sterile dressings were applied before application of the splint. As a rule, sulfanilamide was not dumped into the wound. The ambulance then conveyed the patient to a nearby casualty clearing station where preliminary care was given. Very few patients ever required the use of a tourniquet. The use of a tourniquet in war zones undergoing air raids is dangerous unless a trained person can remain with the patient. Many times ambulance trips are interrupted, and the patient may have a tourniquet on four or five hours instead of thirty or sixty minutes as was originally planned. Most hemorrhage can be stopped by direct pressure. Therefore, unless absolutely indicated, the application of a tourniquet is dangerous.

When the patient arrived at the casualty clearing station he was checked over by a physician and a note of his injuries was made and placed on a card which was suspended from the patient's neck by a string. Thus, a patient having suffered a fractured leg had this information

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written on a card. This tabulation prevented a repetition of questioning and examining for both the patient and the doctor. At the casualty clearing station if the splints that had been applied were not adequate, they were re-applied. Blood plasma was given to patients in shock. Opiates were given for pain. Minor wounds were treated and sutured. Dressing were inspected, and the patients were made as comfortable as possible. After the examining physician had given preliminary treatment to the patient and it was safe to transport the patient to a hospital, this was done.

Many of the patients did not need to be sent to a hospital as they suffered only from minor abrasions and small lacerations which could be cared for at the casualty clearing stations. However, those patients who had major injuries, requiring operating room care, x-ray, or treatment, were immediately referred to a hospital.

Hospital Treatment

The patients would arrive at the hospital any time from an hour or two after the injury up to twelve to twenty-four hours after the injury. As the patients were admitted into the hospital they were again checked quickly to see whether any fracture or injury had been overlooked.

From the admitting rooms the patients were referred to different wards in the hospital, depending on the type of injury they had. Upon arrival at the ward the patients were under the immediate care of a ward surgeon who gave each patient a careful physical examination. All patients requiring antitetanus or antigas gangrene antitoxin were given these sera. If, after examination of the patient and evaluation of the x-rays, it was necessary to do further operative or manipulative work of the fracture, the patient was referred to the operating theater.

Compound fractures untreated up to twelve hours often had performed débridement and primary closure of the wound. It was demonstrated, even in the treatment of a large number of compound fractures, that a careful débridement is the all-important thing and sulfanilamide merely handles the minor potential infections that might be missed by a surgeon. The problem of débridement was discussed several times with Trueta and he again reiterated the fact that he believed that débridement is the all-important factor, plus adequate plaster fixation. He had a series of over 1,000 compound fractures in which débridement only was done and no sulfanilamide was implanted into the wounds. Only six of these patients succumbed to their injuries.

All fracture cases requiring skeletal fixation were treated in one of three ways:

1. The insertion of a wire or pin through a bone for traction.
2. Internal fixation by means of a plate.
3. External skeletal fixation by the Roger Anderson or Haynes apparatus.

If the fracture had been compounded, any of the above methods was applicable, but the Roger Anderson or Haynes technique was preferred by us. The closed plaster method also was used to promote healing of the soft tissues. One cannot emphasize too strongly that adequate fixation of the fracture is most important, both to the comfort of the patient and to the healing of the wound.

Early mobilization of the patient in a war zone is of great importance. A patient who can get to an air raid shelter by himself or who can be up and about himself is a much happier patient than one who has to lie in bed in a traction apparatus or a plaster cast. The Roger Anderson or Haynes external skeletal fixation apparatus was used on nearly sixty patients with great satisfaction. Patients with a fracture of the femur requiring some type of skeletal fixation were able to be up and about on crutches and many of them could bear some weight on their extremity. If this external skeletal fixation had not been used these patients would have been confined to bed in plaster casts or in traction apparatus. Not in one case was the use of these apparatuses regretted. In the majority of cases the patient was a much happier man and he could be up and about, helping himself instead of being a bed case requiring nursing care. These cases have been reported in a previous publication by Bradford and Wilson.

In the treatment of old fractures and infected fractures, again the Roger Anderson or the Haynes apparatus was used. Many cases of infected compound fractures can be reduced and held by the external skeletal fixation and yet have the closed plaster technique carried out. Each time the plaster has to be changed the patient does not have to be anesthetized, as the

procedure usually is a painless one, and with each change of plaster the fragments are not manipulated about and infection lighted up.

Many of the cases of badly infected compound fracture cleared up miraculously under the closed plaster technique. There was not one case in which the closed plaster technique had to be discontinued in favor of open dressings. In conjunction with the closed plaster technique the patient receives adequate dosages of either sulfanilamide or sulfathiazole by mouth. Sulfadiazene was not available at the time that this treatment was carried out. All infection was treated in the operating room and each time the plaster was changed sterile technique was carried out so as to prevent any possibility of re-infection of the wound. It reduces the chance of re-infection to once a month instead of once a day, besides being the most comfortable treatment for the patient. Nursing care was reduced to a minimum, and the patient instead of being helpless becomes helpful.

Summary

Wartime casualties resulting from air raids are similar to injuries caused by civilian accidents.

The treatment in many of the air raid casualties is similar to care of patients suffering from civilian injuries.

Many of the cases are seen later than they usually are seen in civilian practice.

Early mobilization of the patient in a war zone subjected to bombing is of great importance.

The Roger Anderson and the Haynes apparatus offer a safe and satisfactory method of mobolization of a patient with a fracture.

Sulfanilamide and sulfathiazole have proved to be of value but are not as important as a careful débridement and adequate fixation of a compound fracture.

EPISIOTOMY

Indications and Technique

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EPISIOTOMY has been called a nicety of obstetric practice. If visible or hidden perineal lacerations are to be avoided during parturition, it is more truly a necessity of good obstetrics in at least 90 per cent of primiparous labors and 60 per cent of all cases. One seldom regrets having done an episiotomy but one often regrets not having done one in cases where elasticity of the pelvic floor during delivery was seemingly but not actually sufficient to prevent lacerations.

An episiotomy is a clean cut of the vulvar ring away from the sphincter ani. Such an incision can be accurately repaired. It replaces a probable irregular laceration which would have been more difficult to repair and which might have involved the anus. A central or median incision is more properly called a perineotomy and unless the perineum is wide, its use invites extension through the anal sphincter. A true episiotomy is a mediolateral incision of the perineum and is oblique in direction. Lateral incisions which sever the more sensitive tissues of the labia majora have been largely abandoned.

The operation has become increasingly popular during the past twenty-five years. During that period many improvements in technique have been made which add to the satisfaction of both the doctor and the patient.

Maternal Indications

Indications for episiotomy may be either maternal or fetal.

Maternal indications make up the larger group. One might say that primiparity in itself is an indication for episiotomy since 90 per cent of primiparæ who do not have episiotomies done show more or less relaxation of the perineal tissues. Conversely, when episiotomy is done on primiparæ, the integrity of the soft parts usually remains as unimpaired as in the nulliparous state.

Read in a Symposium on Obstetrics at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 29, 1942.

The more absolute maternal indications for the operation would include congenital defects such as the narrow perineum of genital hypoplasia; the narrow arch of the android or funnel pelvis in which the fetal head encroaches more than usual on the posterior portion of the pelvic outlet; the rigid perineum of the elderly primipara; the scarred perineum resulting from a previous plastic operation; and the edematous vulva of the toxic patient.

Sometimes the rapid descent of the fetal head in a short, tempestuous labor, without crowning, necessitates an episiotomy.

The operation should always be done before a forceps delivery or before a breech extraction since lacerations are almost certain to occur.

Fetal Indications

In the case of breech extraction, the indication for episiotomy is fetal as well as maternal. The performance of a deep episiotomy may mean the difference between a living or a dead baby during extraction of the after-coming head.

Another fetal indication is concerned with the shortening of the second stage of labor for the protection of the fetus. Cerebral injury frequently results from prolonged use of the fetal head as a dilator of resistant perineal structures. The perineal stage of labor may be shortened by performing an episiotomy and following it by making pressure on the fundus of the uterus during contractions. Fundal pressure often successfully terminates labor. When it fails, outlet forceps may be applied more safely after an adequate episiotomy has been done.

The other important fetal indication is prematurity. Premature infants have wide sutures and soft skull bones which offer little protection for the poorly developed vascular system and the weak connective tissue supports of the brain. With such predisposition to intracranial damage, episiotomy often becomes indicated to prevent undue pressure.

Timing

The timing of episiotomy should be a matter of careful judgment. One should not wait until crowning is marked and probable tearing of muscle fibers has occurred. Rather one should make the incision soon after the head descends to the pelvic floor at a time when some stretching has occurred but before damage has been done. Ironing out of the perineum is usually a questionable procedure. It may be indicated before the episiotomy done preceding a midforceps operation or before a breech extraction when the presenting part is high. Often, however, it does exactly what we are trying to avoid, that is, it produces hidden lacerations which result in a lax pelvic floor.

Technique

General rules in the technique of episiotomy include consideration of the following points: (1) asepsis; (2) an adequate incision; (3) adequate control of bleeding; (4) the use of fine, absorbable sutures; (5) the prevention of undue suture tension; (6) the avoidance of dead tissue spaces; (7) the adequate exposure of the wound during repair; (8) the accurate approximation of tissue layers; (9) the avoidance of placing sutures through the rectum. Only a few pertinent details of these rules will be discussed.

Relative asepsis after cleansing the parts may be insured by placing a towel diagonally across the perineum and fastening its edge to the skin from beneath the towel with several Allis forceps.

The incision is best made diagonally from the middle of the fourchette and to the right. A right-sided episiotomy is easier to repair unless the operator is left-handed. It should be long enough and deep enough to prevent the occurrence of a laceration at either the vaginal or perineal end of the wound. Often incising the mucosa for an extra inch or more on the vaginal side will prevent irregular extensions of the incision.

Bleeding can often be controlled by means of pressure but usually it is necessary to use Kocher hemostats, taking rather generous bites of tissue to limit venous bleeding. The hemostats may be left on during the delivery and removed during the repair.

A considerable amount of blood can be lost from an oozing episiotomy wound and for this reason it is not advisable to make the incision too early or to delay delivery long after it has been made. If uterine contractions or pressure will not accomplish delivery promptly, low forceps extraction is indicated.

Local infiltration anesthesia with one per cent novocaine solution containing two or three drops of adrenalin to the ounce markedly reduces bleeding and this decrease in blood loss is one of the advantages of the procedure.

The use of absorbable sutures alone has largely replaced silk-worm and silk which were the ma-

terials formerly used for the en masse repair of lacerations by means of several interrupted through-and-through sutures. Painful tension sutures are rarely necessary. The chromic catgut used should be as fine as possible. No. 1 is strong enough and sometimes No. 0 is preferable.

A minimum of suture material should be used and as few square knots should be buried as possible. Yet it is better to use more catgut and avoid dead spaces in the approximated wound than to use too little. The markedly vascular perineum is remarkably tolerant of foreign material and will often heal under the most adverse circumstances.

Sutures should be tied neither too tightly nor include too large masses of tissue in each bite. Either error will result in painful healing and will invite breaking down of the repair.

Good exposure of the wound is an important point in doing a good layer repair. It is best accomplished by an assistant standing on the left side of the patient holding two right-angled retractors one under the symphysis and one to the left side. A Gelpi retractor placed at the two muco-cutaneous junctions of the wound when an assistant is not available may be spread to give good exposure. A vaginal pack helps to keep blood from obscuring the wound and one with a tape attached to it is less liable to be left in the vagina at the end of the repair than one without such a reminder.

Suturing, in my experience, is best done by starting at the upper and mucosal angle of the wound with a half-length suture, the first stitch encircling the deeper tissues and thus preventing a weak spot or pouching at this point in the vagina. After it is tied, it is carried down as a continuous suture to the hymenal ring, care being used to take longer bites on the medial side of the wound than on the lateral side, thus insuring symmetrical approximation at the mucocutaneous junction. This detail of the procedure is necessary because there are muscle fibers on the lateral side of the incision which retract and shorten the wound-edge while the medial side is relaxed and lengthened by being pulled down by the perineal body.

When the continuous mucosal suture has been carried down to the hymenal ring it is laid aside and left long for skin closure later. Interrupted sutures are now placed in the severed portions of the levator ani and the more superficial tissues.

Care must be taken to avoid placing sutures in the rectum which is much closer to the medial side of the wound than one would think. There are several alternative methods of preventing this accident. A sterilized test tube may be used as a rectal guide or, better still, an aluminum, sausage-shaped rectal guide made for the purpose, may be inserted during the repair. One-finger gloves which are made to slip over the forefinger of the gloved hand are also available. Sometimes an intrepid assistant will insert his gloved finger in the rectum while sutures adjacent to the bowel are being placed.

The repair is finished by uniting the superficial fascia beneath the skin with a continuous suture which is the same one used to unite the vaginal edges of the wound. The rest of this suture is then threaded on a fine, curved, cutting needle and is continued upward subcutaneously to finish the repair. One through-and-through stitch with this suture is placed at the hymenal ring and is tied. It is the only knot visible at the end of the closure.

Complications

Infection of the perineum occasionally will cause partial or complete separation of an episiotomy wound. When this complication occurs, cleansing of the wound two or three times a day with sterile water followed by the application of equal parts of sulfanilamide and sulfathiazole crystals in a spray will usually clean it up in three or four days. It then may be secondarily repaired under local infiltration anesthesia a day or two before the patient leaves the hospital. A few through-and-through, heavy dermal sutures are placed, tied, left long and all of the long ends are tied together. These sutures will be removed a week later when secondary healing has occurred. The procedure usually does not prolong a hospitalization period of ten days and the result is usually as good as in a wound healing by primary intention.

Another rarer complication of episiotomy is a hematoma of the perineum sometimes dissecting up into the broad ligament. Small hematomas absorb. Large ones may need to be incised and drained externally.

When routine rectal examination after the completion of episiotomy repair reveals a suture through the wall of the rectum, it is best to leave it alone if no narrowing of the lumen is palpable. Cutting of the suture may start troublesome

venous bleeding in the rectum. If, however, it seems advisable to cut the suture, it may be done with blunt-tipped scissors through the anus. It should not be pulled out after cutting but should be left *in situ*.

After Care

After-care of an episiotomy wound should be simple. Daily cleansing perineal douches are routine. A heat lamp directed on the perineum two or three times a day for fifteen or twenty-minute periods when the patient complains of discomfort is helpful. Application of one of the anesthetic ointments to the suture line once or twice a day reduces sensitiveness and irritation.

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SULFATHIAZOLE AS A GONORRHEA PREVENTIVE

Encouraging Results Obtained by Giving It By Mouth To An Experimental Group of 1,400 Soldiers Before Exposure

From results obtained in an experimental group of soldiers, sulfathiazole administered by mouth appears to be an effective preventive against gonorrhea and chancroid, Capt. James A. Loveless and Col. William Denton, Medical Corps, Army of the United States, declare in *The Journal of the American Medical Association* for March 13 in a preliminary report of their investigation.

"Its administration in this experimental group," the two men say, "has not been attended by serious reactions. Sufficient evidence has been obtained to justify further extensive study of this problem."

In the introduction to their report the two officers say that "Our purpose in this study is to determine whether the prophylactic administration of sulfathiazole prevents the development of gonorrhea. The existence of an inordinately high gonorrhea rate among certain troops makes the development of an easily administered chemical prophylaxis particularly important. The following incomplete experimental data are published as a preliminary report because of the encouraging results already achieved. . . ."

The test group in the study consisted of a company of approximately 1,400 Negroes and the control group of approximately 4,000 Negro troops from the same post. In summarizing their report the authors say that "A company of approximately 1,400 Negro troops was given sulfathiazole prophylaxis of 2 Gm. before leaving the fort on pass. Those taking station prophylaxis received no further drug. All others received 4 additional Gm., 2 on returning to the fort and 2 the next morning.

"In this company there has occurred a phenomenal disappearance of gonorrhea and chancroid. Excluding the 'failures' not under the influence of the drug at the time of exposure, the gonorrhea rate dropped to a level of 8 per thousand yearly as compared with 171 per thousand in the control group, and the chancroid rate dropped to 6 as compared with 52."

Commenting on their study the two men say that "It is recognized that this presentation is preliminary in nature. However, it is believed that sufficient evidence is presented to prove that sulfathiazole prophylaxis will prevent gonorrhea and chancroid. It is our opinion that, under certain conditions and in a final form yet to be developed, prophylactic sulfathiazole administration would produce a remarkable decline in gonorrhea and chancroid in the Army. It is admitted that certain dangers are involved in administering this drug, particularly on a large scale, and that the answer to certain questions has not yet been determined. In view of the magnitude of the venereal disease problem and its effect on man days, we believe that the risks are justified.

"This experiment is being continued in an effort to simplify the administration of the drug and to obtain further corroborative data. . . . Until such data are available the study is not being extended, nor is it felt advisable that such measures be made routine practice."

The authors point out that the cost of this prophylaxis has been about 10 cents per soldier monthly. In a footnote they point out that since the preparation of their report 20 soldiers in the test group were subsequently admitted to the Station Hospital for various illnesses. All of them had previously received sulfathiazole as a prophylaxis. All of this group received sulfathiazole as a part of the treatment for the illness for which they were admitted to the hospital and in the entire group the treatment response to the drug was satisfactory and there were no reactions.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

A. J. Hertzog, M.D., and S. V. Loisness, M.D.
Pathologists

Presentation of a Case
Case A-43-428

DR. ARTHUR: This case is that of a fifty-seven-year-old white woman who was admitted to the medical service on October 16, 1942. She was first seen in this hospital in March, 1940, complaining of an ulcer of the left leg which had been present for fifteen months. A biopsy of the ulcer at this time showed only a chronic suppurative type of inflammation. She was treated with all types of conservative therapy, including packs and superficial x-ray. The ulcer continued to spread over the entire left lower leg. The patient was transferred to the surgical service. An amputation was done just above the condyles of the femur. The clinical impression was that the ulcer was due to a deep thrombophlebitis. On this admission she subsequently developed some pain in the right flank. A left nephrolithotomy was done with the removal of a stone. The patient was then transferred to Parkview Sanatorium, where she spent almost an entire year. She was again admitted to the hospital in April, 1941, because of purulent drainage from a tumor nodule on the right thigh. A biopsy of the skin nodule was done and diagnosed by the department of dermatology as mycosis fungoides. She was then followed in the outpatient department, complaining of chronic dermatitis on the left thigh. Her last admission to the hospital was in October, 1942, because of ulcerative lesions of the skin on the right leg. She said that about fifteen or seventeen of these lesions had formed on the right leg within the past six months.

Physical examination showed a normal temperature. The blood pressure was 132/78; the pulse was 80 and respiration 18. The left leg had been amputated just above the knee. There were many small pigmented areas over the calf of the right leg and on the right thigh. There was a punched-out ulcer on the medial aspect of the left thigh, with an indurated inflamed area surrounding it. The lungs and heart were reported negative. The liver was palpable just below the costal margin.

Serological studies were negative for syphilis. The hemoglobin was 86 per cent (Sahli). The leukocyte count was 6,800 with 75 per cent polymorphonuclear neutrophiles. There was no evidence of immaturity of the leukocytes. Unrinalysis was negative. An x-ray of her chest in October, 1942, was reported as normal.

She was given a course of superficial x-ray therapy for the ulcerative lesions on the lower extremities. These responded poorly. She subsequently developed some lesions on the back. After two months some of the lesions on the extremities healed but later recurred. In January, 1943, decreased breath sounds in the right lower chest, with dullness on percussion, was noted. She developed a cough, fever, and complained of pain on respiration. The clinical impression was pneumonia of the right lower lobe. Examination of the sputum showed type 17 pneumococci. She was given sulfathiazole and showed some improvement. However, one week later her temperature again became elevated, and she developed a persistent cough. There was a friction rub over the posterior chest. X-rays at this time showed a rounded mass in the right posterior chest with evidence of some hydrothorax. On February 24, a thoracentesis was done with the removal of approximately 50 c.c. of purulent fluid. Cultures were negative. Numerous subsequent thoracenteses were done and cultures were persistently negative for tubercle bacilli. On March 11 her temperature suddenly rose to 103 degrees, and she began to raise blood-tinged sputum. She complained of severe pain in the right side of her chest. She expired on March 14, 1943.

DR. HERTZOG: Dr. Stenstrom will now show the x-ray films.

DR. STENSTROM: The first pictures of her chest in January, 1943, showed a density in the right lower lung, with some evidence of pleural effusion at the right base. The next examination showed a rather sharply demarcated density in the right cardiophrenic angle. The question arose as to whether we were dealing with a mediastinal effusion, an unusual leaflet of the diaphragm, or a neoplasm. A lateral film shows a dense area in the posterior portion of her chest. About this time Dr. Moosnick obtained purulent fluid from the chest, so a mediastinal empyema was our first consideration.

INTERN: From what part of the chest was the purulent fluid obtained?

DR. PETIT: The aspiration was done posteriorly in the midscapular line through the 8th interspace.

DR. STENSTROM: The findings are not those of a bronchogenic carcinoma, as the diaphragm is not elevated; the mediastinum is not displaced; and there are no signs of atelectasis, as one would expect in the case of a tumor occluding a bronchus.

DR. PETIT: There are a few things in this case which might be mentioned. Differential white blood counts on several occasions showed an eosinophilia as high as 15 per cent, and on other occasions of 5 to 8 per cent. About two days before she died, another chest tap was done, and about 10 c.c. of purulent material were obtained. A culture of this showed a hemolytic streptococcus.

STUDENT: Could there be a relationship between the skin lesions and the findings in her chest?

DR. HERTZOG: I was hoping someone would bring up this question. In the literature and older textbooks, one gets the impression that involvement of the internal organs in mycosis fungoides is rare. However, Lawrence Bergman (Arch. Path. 29:530-540, 1940) was able to find eighteen cases in the literature in which autopsies had been performed in mycosis fungoides; in sixteen of the eighteen cases, the internal organs were found involved. The organs most frequently found affected were the spleen, liver and lungs. Dr. Arthur will now give the autopsy findings:

DR. ARTHUR: There was an old amputation of the left leg. The skin lesions have already been described. The right pleural cavity contained about 1,000 c.c. of reddish brown fluid. The left cavity showed no fluid. The right lung weighed 1,120 grams. There was a large grayish-white tumor mass in the right lower lobe that surrounded the lower bronchus. The tumor appeared quite necrotic and had the gross appearance of a bronchogenic carcinoma. The upper lobe showed some congestion. The opposite lung weighed 340 grams and showed nothing of note other than edema. The heart was not remarkable. The spleen and liver grossly appeared normal. Enlarged lymph nodes were not found. The remaining organs showed nothing of note. Dr. Hertzog will demonstrate the microscopic sections of the organs.

DR. HERTZOG: This slide shows a section of the large tumor mass from the lung. The center is necrotic, as the cells grew too fast for the blood supply. However, at the periphery we can recognize cellular detail. The histologic picture is that of a malignant lymphoblastoma and not that of a bronchogenic carcinoma. You see considerable reticulum hyperplasia and many nucleated giant cells. In this particular area, a small bronchus is surrounded by tumor tissue, but the wall is not invaded. The histologic structure resembles Hodgkin's disease more than any other type of lymphoblastoma. A section of the opposite lung shows only bronchopneumonia. The next slide is a section of skin removed at autopsy. From this section alone we can say nothing other than that it shows collections of lymphocytes scattered in the corium beneath the epidermis. This section of the kidney shows a small area in the cortex that has the histologic structure of the large lung tumor. A section of the liver shows areas of reticulum hyperplasia, lymphocytes, and multinucleated giant cells around the portal spaces. This, too, resembles Hodgkin's disease. The spleen shows nothing of note, other than an occasional giant cell in the pulp. Possibly, if this patient had lived long enough, she would have developed lesions in the spleen resembling those in the lung and liver.

A diagnosis of mycosis fungoides in this case rests upon the clinical findings of the dermatologists, together with a skin biopsy and the autopsy findings of a malignant lymphoblastoma. According to modern writers, mycosis fungoides is a dermatologic disease having neoplastic characters and probably arising from the reticulo-endothelium. It was first described by Alibert in 1814. The name, mycosis fungoides, is a misnomer. Klemperer thinks the disease starts with a reactive proliferation of the reticulum on an inflammatory basis, and in the course of time this loses its balance and becomes neoplastic. Involvement of the internal organs at autopsy appears to be the rule rather than the exception. The findings are those of a malignant lymphoblastoma. Some cases may resemble lymphosarcoma. In other cases the findings, like this one, are those of Hodgkin's disease. Berman reported a case of mycosis fungoides from the Department of Pathology of the University of Minnesota in 1940, in which the autopsy findings were those of leukemic reticuloendotheliosis. If we called those cases that showed immaturity in the peripheral blood, leukemia, and cases similar to this one, Hodgkin's disease, we would be obliged to accept Symmer's view (Arch. Dermat. and Syph., 25:1, 1932) that mycosis fungoides does not exist. It seems to me that mycosis fungoides should be regarded as a clinical rather than a pathological entity. The picture of dermatitis, infiltration of the skin, tumor formation, and ulcerations of the skin, may be due to various members of the lymphoblastoma group. There is apparently no valid argument in defense of the specificity of the histologic picture of mycosis fungoides.

Anatomical Diagnosis: (1) Mycosis fungoides with involvement of skin, right lung and liver; (2) bronchopneumonia; (3) right hydrothorax.

LACK PEP? SOLDIERS CAN BLAME IT ON TROPICS

Soldiers and sailors in the tropics who, after serving there for a time, feel listless, low and pepless can blame it on the climate. Justification can be found in a report by Commander James L. McCartney, Medical Corps, U. S. Naval Reserve, to *War Medicine,* published under the auspices of the National Research Council and the American Medical Association.

Low blood pressure and a low basal metabolic rate are likely to develop sooner or later after residence in the tropics, Commander McCartney states, quoting reports from a number of physicians who have studied the problem. The metabolic rate is that at which energy interchanges in the body proceed. The basal metabolic rate is that for the energy of mere existence.

Low blood pressure affects many but not all persons in the tropics. It does not, however, appreciably affect those with high blood pressure. This lowering of the blood pressure resulting from life in the tropics without such other causes as debilitating tropical diseases like dysentery is due, according to one authority, to the following conditions:

Constant dilatation of the small blood vessels near the surface of the body.

Increased secretory function of the skin, such as sweating.

Visceral influences.

Constriction of the small superficial veins.

Variations in the volume and viscosity of the blood. —*Science News Letter,* May 29, 1943.

FOOT FUNCTIONS FOLLOWING THE LOSS OF THE TARSAL NAVICULAR

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THE tarsal navicular bone constitutes a segment in the medial longitudinal arch of the foot. As such it serves to transmit a portion of the weight of the limb from the talus through the cuneiforms to the first three digits. By means of its articulations, posteriorly with the talus, laterally with the cuboid, and anteriorly with the cuneiforms, it contributes to the small amount of intrinsic motion of the tarsus. The tuberosity of the navicular, on its medial surface, is the insertion of the tibialis posterior muscle, an adductor of the foot. It is readily apparent that none of these functions is indispensable for a usable foot. This suggests the question: exactly what happens to the foot in case of loss of the navicular?

A search of standard fracture textbooks and the Index Medicus for the last ten years was not particularly fruitful in finding an answer to this question. Scudder,[6] Böhler,[1] and Key and Conwell[5] do not mention the subject of removal or absence of the tarsal navicular. Kellogg Speed[7] states that in cases of fracture—dislocations of this bone in adults, "excision of the major fragment with or without fusion of the talocuboid joint" is the only satisfactory treatment. In the cases of adolescents with comminuted fractures, he also recommends excision of the bone subperiosteally and says that regeneration may "be awaited while the foot is kept at rest in inversion. Any new-formed bone fits the space perfectly and is protected during weight bearing by an arch support or adhesive tape strapping for several weeks."

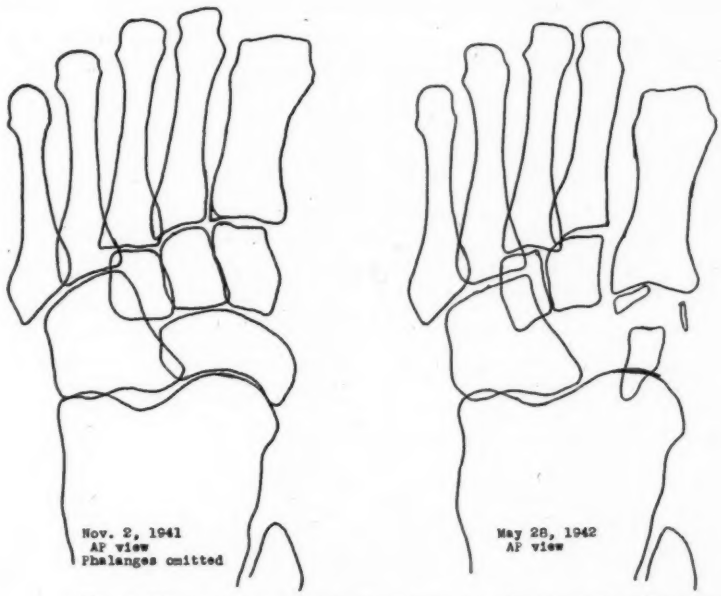

Fig. 1. Diagrams from roentgenograms, antero-posterior view, taken November 2, 1941 (phalanges omitted), and May 28, 1942.

Hauser[4] believes that where multiple fragments of the navicular are present, open operation and removal of the loose pieces should be done. Arthrodesis is recommended under certain conditions. Crossan,[3] in 1930, recommended removal of the navicular in compression fractures but did not state what happened to the foot after this was done.

Gorrell and Wilson,[8] in 1936, reviewed some of the recent literature on fracture of the navicular in which several authors favored removal of the bone in comminuted fractures. They stated further that it would be advisable to fill the bony defect with a bone graft.

This recommendation is based on three theoretical considerations:

"1. Because of the internal longitudinal arch being shortened and the external longitudinal arch remaining the same length, it is inevitable that the foot anterior to the astragalus would angulate medially, resulting in lateral strain on the calcaneo-cuboid and subastragaloid articulations.

"2. Removal of a portion of the arch shortens it in the vertical plane, and brings it closer to its base.

"3. The astragalus, being no longer supported anteriorly by the scaphoid, tends to rotate forward on the calcaneous. This process might continue to the point of changing the weight-bearing surface of the astragalus in the ankle joint."

The case to be presented in this article offers an interesting test of these three considerations.

Fig. 2. Photograph taken seven months after accident. Note shortening of right great toe.

Fig. 3. Medial view of foot in June, 1942, seven months after accident.

Fig. 4. Patient standing on tip toe, June, 1942.

Case Report

O. A., a sturdy young man of eighteen, weighing 190 pounds, was walking across a field on November 2, 1941, carrying a twelve gauge shotgun in his right hand. The gun accidentally discharged and the full load passed through his right foot. The muzzle of the gun was only about one and a half feet from his foot when it discharged. He was clothed in heavy overalls, heavy shoes and stockings, and portions of these were later found in the wound. A hunting companion applied a cloth tourniquet and there was apparently little immediate hemorrhage. The patient arrived at the hospital in good physical and emotional condition.

Examination of the right foot revealed a dorsal wound measuring about 5x3 centimeters of the navicular-cuneiform region. Opposite this, on the volar aspect, was another wound measuring 3x2 centimeters, where part of the charge had passed on through. The comparatively small size of these wounds was, of course, due to the extreme proximity of the gun at the time it was discharged. X-rays showed the presence of numerous shot and fragmentation of the navicular and first cuneiform.

Under ethylene-ether anesthetic a thorough débridement was done. The navicular and first cuneiform were so riddled with shot and felt wadding that it was considered necessary to remove them completely. After all devitalized tissue had been excised there remained a hole about 3 centimeters in diameter entirely through the foot. No attempt was made to remove shot which had recochetted into the healthy surrounding tissue. The wound was irrigated with two liters of saline, sprinkled with three grams of sulfanilamide, two soft rubber drains inserted through and through, and wrapped with bulky dry dressings. The patient was given a double prophylactic dose of combined gas bacillus-tetanus antitoxin.

He was given sulfathiazole by mouth for thirteen days postoperatively. During the first seven days there was considerable bloody drainage but no swelling or local sign of infection although his temperature rose to a maximum of 103°. During the following week the temperature gradually fell to normal and the drainage became serous. Dry dressings were used the first week and thereafter irrigations with epsom salt solution and chloramin-T were employed. On the thirteenth day he was given a transfusion of 350 c.c. of whole blood to boost his hemoglobin which had fallen to 60 per cent, Sahli.

He left the hospital on his thirteenth postoperative day, in good condition, with the instruction to soak the foot daily in epsom salt solution. The wound granulated out from the center, and in a month there remained only two superficial raw surfaces, one on the dorsum, the other on the medial volar aspect of the foot.

The patient was able to return to school with the aid of crutches on January 5. Epithelialization of the surface wounds was slow, and not complete until the end of March. The patient was permitted to wear a shoe as soon as bulky dressings were no longer necessary. He was given an arch support. By the middle of May he was able to walk very well with only a slight limp. At the time of this writing (July) he does all kinds of heavy farm work, walks with a barely perceptible limp, is able to rise on his tiptoes without difficulty and has no symptoms referable to his right leg or foot.

During the period of healing, it became evident that compensation for the two missing bones was taking place, not by a medial angulation of the foot, but by a posterior migration of the first metatarsal and phalanges. Roentgenograms of the foot taken in June, seven months after the injury, show that the great toe has been drawn backward two centimeters, so that the base of the first metatarsal is only two centimeters from articulating with the talus. The second and third cuneiforms lie in contact with the talus, but their respective metatarsals maintain their original positions. There is still a good longitudinal arch. There is no

evidence of rotation of the talus. The talo-cuboidal articulation and ligaments are apparently sufficient anchorage to compensate for loss of the supporting effect of the navicular.

Summary

A case is presented in which the tarsal navicular and first cuneiform were lost, due to a gunshot wound. After débridement, the foot healed satisfactorily, the gap caused by the missing bones being filled by a posterior migration of the first metatarsal and its phalanges. The end result is a well-functioning foot. The only deformity is a shortening of the great toe.

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PROTRUDED INTERVERTEBRAL DISC

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The patient is an interior decorator, aged thirty-seven. The previous medical history is negligible.

Present Complaint.—Since the age of ten, the patient has had recurrent attacks of lower back pain. These have occurred at irregular intervals with a free period at one time of six or seven years. This periodic pain has been severe but not disabling. The pain has always been aggravated by coughing or sneezing. Between these episodes he has been entirely free of backache or other symptoms.

During June of this year, I saw this patient at his home. On the day previous he had been lifting a heavy radiator and felt a sudden pain in the lower back. He continued his work but with great difficulty on account of this severe lower backache. The next morning he got up and while dressing sneezed violently and was immediately conscious of a terrific pain down the distribution of the left sciatic nerve. He fell to the floor and when I arrived at his home he was writhing in pain. He was given ⅓ gr. of morphine intravenously and taken to the hospital. There he was put at rest in bed with local heat and appropriate sedation.

Air study on the next day disclosed a defect on the left side opposite the fourth lumbar interspace.

Physical Examination.—Disclosed a positive Lasègue sign, absent knee jerk and diminished Achilles reflex on the affected side. There was also tenderness on thumb pressure over the fourth lumbar interspace. Examination of the spinal fluid disclosed normal cytology; the total protein value was 183—normal about 25.

Hemilaminectomy on July 1 disclosed a protruded nucleus pulposus on the left side at the fourth lumbar interspace, pinching the nerve root against a greatly thickened ligamentum flavum.

Resection of this structure and removal by curette of the protrusion was accomplished. Convalescence was rapid and uneventful and after twelve days the patient was allowed to leave the hospital and will return to work three months after date of the operation.

Discussion.—The syndrome of protruded intervertebral disc has been generally recognized and understood, clinically and therapeutically for only about eight years. The lesion is a mechanical one. Some trauma or strain produces an injury to the cartilaginous shell of the intervertebral disc, allowing prolapse of the semisolid nucleus pulposus. The spinal nerve root which emerges from the intervertebral foramen is pinched between the herniated nucleus and the ligament flavum. This situation results in the symptom complex of lower back pain and sciatic neuritis. The disease is typically chronic and recurrent. The protruding nipple of tissue tends to become swollen and edematous as a result of minor strains or trauma. Following this, the patient experiences a more or less severe episode of lumbago and sciatic pain—usually and typically unilateral. A period of rest in bed encourages subsidence of the edema and swelling of the disc with temporary cure of the pain and disability. A repetition of the back strain brings on another episode. Finally the patient tires of the whole thing and seeks the permanent relief which surgery offers.

The symptoms of protruded intervertebral disc are therefore typically recurrent seizures of lumbar backache and unilateral sciatica. There is very characteristically marked accentuation of the pain on coughing or sneezing. On examination, the knee reflex and the Achilles reflex may be normal or diminished, or absent, on the affected side. Pain on raising the fully extended lower extremity is universally present in this condition. This is known as Lasègue's sign. The existence of the lesion may be confirmed and demonstrated by x-ray study after the injection into the subdural canal of a contrast medium such as iodized oil or air. A typical punched-out defect is noted opposite the protrusion.

The case I have reported is, I believe, unusual in view of the extreme severity and sudden onset of excruciating lumbar backache and sciatica following a history of recurrent lumbago without sciatic pain extending over a period of more than twenty years.

Read before the Southern Minnesota Medical Association, Rochester, Minnesota, September 28, 1942.

HISTORY OF MEDICINE IN DODGE COUNTY

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and

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(Continued from May issue)

The old Wasioja seminary, which has been mentioned previously, herein, attracted a homeopathic physician, **Dr. John Lewis Martin** (1808-1885), to Wasioja at some time in the seventies. He came from Frankford in Mower County, so that his children might be educated at the seminary at Wasioja, and he helped various Methodist clergymen or sometimes even substituted for them in the pulpit at Wasioja. He remained in that village until his death in 1885. Part of the time, it would seem, Doctor Martin was a minister, and he is known to have occupied the pulpit of the Wesleyan Methodist Church of Wasioja at various times in 1879 and 1880.[68]

It seems probable that **Dr. Chauncey Almer Kelsey** (1847-1918) settled in Concord in August of 1877.[69] He is known to have visited Kasson in that month with Doctor Higgins.[70] He had been graduated from the Chicago Medical College (Northwestern University) in 1875, and he stayed in Concord for only a short while. His son, Dr. C. G. Kelsey[71] of Hinckley, Minnesota, has reported that during the latter part of his father's life the elder man was interested chiefly in real estate and other endeavors, but examination of Dr. C. A. Kelsey's remarks at different sessions of the Minnesota State Medical Association, as reproduced in the *Transactions* of that organization, show that he was keenly interested in the practice of medicine. He practiced in the Territory of Dakota and in Illinois, Colorado, California and other places before he died. He became a member of the Minnesota State Medical Society on June 23, 1899, at the thirty-first annual session of that body in Minneapolis, and at the time he was living in Minneapolis. The secretary[72] of the South Dakota State Board of Health has not been able to discover that Doctor Kelsey was licensed to practice medicine in the Territory of Dakota, and records[73] of the State of Illinois would indicate that he was never licensed in that state.

In the summer of 1878 mention was made of **Dr. Charles S. Beaulieu** of Concord, thus establishing the fact that he had been there for ten years. Woods[13] and Moreland[67] said that Doctor Beaulieu married a young widow, Mrs. Lena Green Slocum,* a native of Vermont[75] reared in Dodge County. Doctor Beaulieu, a veteran of the War of the Rebellion, is known to have been called to Brownsdale in Mower County in November of 1880 as pastor of the Christian

*Widow of Dr. Julius Franklin Slocum (1843-1874), who had come to Mantorville with his parents in 1853, and who died in Marion in Olmsted County on November 9, 1874.

Church in that town.[75] He also practiced medicine there. By 1895 he was living in the village of New Haven, Missouri.[40] He was never licensed to practice medicine in Missouri,[76] nor does it appear that he had the desire to do so. Instead, he preached in the Christian Church in New Haven. Grannemann[77] reported that residents of New Haven had never been aware that Doctor Beaulieu was a physician. It is known that Doctor Beaulieu had been educated for the Roman Catholic priesthood,[75] and that at some time early in his life he had been converted to Protestantism. Hence, the report of Grannemann[77] would seem to be correct; but why Doctor Beaulieu ceased to practice medicine after he left Minnesota is a question the authors cannot answer on the basis of data at hand.

In the summer of 1878, it was noted,[78] **Dr. D. B. Geil** of Pine Island moved his "Turkish Bath and Vapor Institute" to Mantorville in Dodge County, and he opened it for business in November.[79] In July, however, **Dr. John Flood** (1850-1918) had located at Mantorville, and in the fall he converted an old school building into a "Hygienic Institute" of his own. A steam engine and vat for his institute arrived in Mantorville in the latter part of September. In December of that year Doctor Geil removed to Kasson.[80] He had previously offered to move to Kasson if the citizens of that town would present him with $100.00;[81] whether this sum actually was paid to him or whether Doctor Flood's competition was too keen is not known. Late in 1879 Doctor Geil moved to Wabasha with his "institute," and it is believed that the steam boiler of his apparatus subsequently exploded, scalding him severely if indeed not fatally.

Still another physician came to Dodge County in August of 1878. He was **Dr. Francis Alfred Comfort** (1841-1915), a Canadian, "of some twelve years' experience."[82] He was in Concord for only a short period, and never was licensed to practice medicine in Minnesota.[40]

At some time in 1878 **Dr. Nils Schultz Holterman** (1845-1895) of Kasson left the county to settle in what was then the new railway town of Glenwood. There he lived for the rest of his life. Very little is known about his professional career while he was a resident of Kasson.

It is interesting to note that necropsy was carried out in Dodge County in September of 1878. It was performed by Doctor Flood, and he was assisted by Doctor Garver, Doctor Ranson and Dr. John Lewis Martin.[83] Observations made at the time are not available to the authors.

Dr. Howard M. Sargent (?-1890) of Sullivan, Illinois, came to Concord while Dr. Charles Severin Beaulieu (1835-1896) was still there. Doctor Sargent was a former partner of **Dr. Solomon Blood** (1810-1881) of Owatonna. He settled in Concord in December of 1878,[81] and stayed there for several years. He had been graduated from the old Missouri Medical College of Saint Louis on March 2, 1877,[73] and had been licensed in Illinois in the same year.[73] He was coroner of Dodge County in 1880, and secretary of the Dodge County Medical Society in 1881. He was last mentioned in Dodge County newspapers in 1883.[84] In July of 1890 his widow visited friends in Concord, and it was observed at the time that Doctor Sargent had died in Illinois during the spring of that year.[49]

Some physician in Dodge County (probably Doctor Garver of Dodge Center) contributed the following sketch[85] of Dodge Center to the Minnesota State Board of Health and Vital Statistics in 1879:

DODGE CENTER

We are at this point on the Winona & St. Peter R.R. in a rich prairie and comparatively level country. This is the highest general surface on the line of this road between the Mississippi and the Minnesota rivers, this region forming the divide between the valleys of the two rivers. Diphtheria has never prevailed here. There have been only a few sporadic cases in the last seven or eight years.

Doctor Ranson and Doctor Garver of Dodge Center, Doctor Sargent of Concord, and Doctor Porter and Doctor Woodard of Claremont, coöperated to report in that year (1879) that the population of the county was 11,413.[86] There had been 118 deaths in the county during the year, of which six were caused by diphtheria.[86] A report[86] of the public health of Claremont was presented:

CLAREMONT, 1879.—For five or six years previous to report made in autumn of 1879, only sporadic cases of diphtheria had occurred in this vicinity. Dodge county has been singularly free of any important prevalence of the disease. Reporter gives a case of malignant diphtheria beginning at a place a few miles distant, within the sphere of a severe epidemic, moved to a non-infected locality near Claremont, proved fatal, and two mild cases resulted in the same house. The hygienic surroundings were good, the public was excluded, disinfectants were used. No further extension of the disease occurred.

1880.—Diphtheria prevailed as an epidemic in April. Of fifteen cases in the vicinity, two were Germans, three Americans, nine Irish and one Scotch—only three deaths. In all except two of the families the sanitary conditions were bad, the houses close, poorly ventilated and filthy. Decaying manure was found in close proximity to wells. This was especially noticeable in the families in which fatal cases occurred.

The deep concern with which diphtheria was viewed in the seventies, in the state at large as well as in Dodge County, was related in part to the fact that although it was recognized as being a "zymotic" disease, the degree of infectiousness was understood by very few physicians. The status of knowledge of diphtheria in the late seventies was touched upon by the Minnesota State Board of Health and Vital Statistics[87] in 1879 or 1880:

The State Board of Health have for the last five years used every endeavor to convince the medical profession and the people of our State that diphtheria was as infectious as smallpox in its behavior during the late epidemics. It is only within two years that the State Medical Society or the American Public Health Association have gone on record in favor of this view. In both societies the resolution was moved by a member* of the Minnesota State Board of Health.

The Doctor Woodard referred to herein a few paragraphs previously was **Dr. Francis Reuben Woodard** (1848-1926), who had settled in Claremont in 1879. Doctor Woodard, who had been reared in Rochester in Olmsted County, remained in Claremont for only about two years. He went to Minneapolis in 1881.

Dr. L. E. Hazen was a resident of Dodge Center at some time in the late seventies. He soon moved to Lowville in Lewis County, New York; the secretary[88] of the New York State Board of Medical Examiners has not been able to trace him further.

The Era of Stabilization, 1880-1890

During the eighties medical practice in Dodge County was in the process of stabilization. Roads were being extended and improved, the railway system

*Dr. Charles Nathaniel Hewitt (1835-1910) of Red Wing, was secretary and executive officer of the Minnesota State Board of Health and Vital Statistics from its foundation in 1872 until his own dismissal from the position in 1897. He was one of the greatest Minnesotans of his era. Folwell, who called him the "Apostle of Public Health," should be consulted (Folwell, W. W.: A History of Minnesota, Saint Paul, Minnesota Historical Society, 1930, vol. 4, pp. 413-425).

was almost complete (but not wholly, as will be shown), and village and township government was orderly and firmly established. The concept that the state should exercise some sort of concern in the health of the people, despite the fact that this concept was less than ten years old in 1880, had been validated in Minnesota by the creation of the Minnesota State Board of Health and Vital Statistics in 1872,* and affirmed by the mutually valuable relationship of county, city and township health officers to that board.

So far as the practice of medicine is concerned, the frontier vanishes from a community when (1) a unified and effective system of regulation of physicians and their activities is created, and (2) when institutions devoted to medical education arise. The first suggests that a scheme of control has evolved which, theoretically at least, will buttress the honest practitioner, dismay the quack and protect the patient; the second implies that there are in the community in question enough physicians sufficiently skilled in their profession to warrant their instruction of students of medicine.

Preparatory schools of medicine had existed in Minnesota prior to 1880, as several writers have demonstrated.[89,90] There was one in Saint Paul as early as 1871[89] and another in Winona in 1872.[90] But in the eighties the development of accredited medical schools in Minnesota empowered to confer the degree of Doctor of Medicine is impressive. The Minnesota College Hospital, founded in Minneapolis in emulation of the old Long Island College Hospital of Brooklyn, was opened in 1881;[91,92] the University of Minnesota Department of Medicine, which offered no courses and conducted no instruction in medicine, was projected in 1882 and founded in 1883;[90] the Minneapolis College of Physicians and Surgeons, which became the medical department of Hamline University in 1895, was opened in October of 1883[93] (but did not confer the degree of Doctor of Medicine upon its graduates); the Saint Paul Medical College, representing a resurgence of the preparatory school previously mentioned, opened in 1885;[89] the Minnesota Homeopathic Medical College was opened at Minneapolis in the fall of 1886.[94]

Another event of paramount interest to students of the history of medicine in Minnesota in the eighties was the passage of the first permanent law of licensure. This was the so-called Diploma Law of 1883.[95] It was the first permanent licensing law in medicine in Minnesota. A crude and unsatisfactory law had been enacted in 1869,[96] but had been promptly repealed in 1870.[97] The *Act to Regulate the Practice of Medicine in the State of Minnesota*[95] of 1883, the "Diploma Law," provided in part that "The faculty of the medical department of the University of Minnesota shall organize as a board of examiners. . . ."[95] This was the faculty of medicine previously referred to herein;[90] it acted as a board of medical examiners and could confer the degree of Bachelor of Medicine or Doctor of Medicine to candidates who could pass its examinations, but did no teaching in medicine. Men who completed the course at the old Minneapolis College of Physicians and Surgeons, for instance, could apply for examination by the University of Minnesota Department of Medicine. If they passed this examination they were awarded the degree of Bachelor of Medicine; if, further, they presented a thesis and defended it satisfactorily, they received the degree of Doctor of Medicine.[90] It is by means of the "Diploma Law" of 1883 and the law passed in 1887 which created an independ-

*It is believed that when the Minnesota State Board of Health and Vital Statistics was established in 1872, it was the third such agency to come into being in the United States, being antedated only by the board of health of the State of Massachusetts and that of the State of California.

ent state board of medical examiners†[98] (and repealed the "Diploma Law" of 1883) that the activities of physicians residing in Minnesota after 1883 can be traced, for even if a physician had been practicing medicine in the state for five years prior to 1883, and had thus gained exemption from the provisions of the act, his name was nevertheless recorded officially, and he received a certificate of exemption or a license.

The development of local medical colleges and the passage of the medical practice act of 1883 affected medicine in Dodge County as it affected medicine everywhere else in the state. The licensing law tended to drive quacks and irregular physicians from the state; the medical colleges soon sent physicians to the county who had been born, reared and educated within the state. The graduate of the eastern medical college was no longer supreme in Minnesota; under the medical practice act of 1883 the physician who had been graduated from a medical college in Minneapolis or Saint Paul was the equal of a graduate of the medical schools of Harvard, Yale, Edinburgh, Berlin, Vienna or anywhere else.

Dr. Frank Henry Garver (1857-1881), son of Dr. James A. Garver of Dodge Center, was in Dodge Center for at least a few weeks after February of 1880. He had been graduated in that month from the Butler University Medical Department of Indianapolis (organized in 1878 as the Medical College of Indiana). A little more than a year later he was dead.

It is possible that a woman physician, **Dr. Z. E. Watkins,** was in Mantorville for a short time in 1881. She issued a card on which it was announced that she treated chronic diseases by means of electricity. Nothing more is known of her, but she may have been an itinerant practitioner.

Dr. Charles Sumner Bigelow (1845-1931) settled in Claremont in November of 1881 to take the practice of Dr. Francis R. Woodard (1848-1926), who had decided to move to Minneapolis. Doctor Bigelow, a graduate of the University of Michigan Department of Medicine and Surgery, remained in Claremont until 1884, in which year he removed to Kansas. He came back to Dodge County in 1890.

In January of 1882 the *Dodge County Republican*[99] of Kasson announced that **Dr. J. Clark Bliss** (1846- ?), "who received a handsome fee for attending our late president" [Garfield?], had settled in Mantorville, to assume the practice of Doctor Flood, who was returning to Chicago. Dr. J. C. Bliss had been graduated from the old Cincinnati College of Medicine and Surgery on June 2, 1875; but whatever else might be said about him, it is certain that he did not attend President James Abram Garfield (1831-1881), for the Doctor Bliss who did was Dr. D. Willard Bliss (1825-1889) of Washington, D. C., as is made clear by several reports[101,102,103] of the stricken President's condition which that physician made. It was said[104] that Dr. D. Willard Bliss received a fee of $25,000 for his services to the dying President.

It is believed that Dr. J. Clark Bliss came from Wisconsin, for he returned to that state in February of 1882 to bring his family and his racing horses to Mantorville.[105] When he finally left Dodge County he was said[106] to have gone back to Wisconsin.

Dr. John Flood did not go to Chicago in 1882; instead, he accepted Doctor Bliss as a partner, and the two men pooled their race horses. While he was in Mantorville Doctor Bliss was elected to membership in the Dodge County Medi-

†It is interesting, although not particularly pertinent, to observe that homeopathic physicians succeeded in obtaining a proviso in this law to the effect that two members of the board must be homeopathic practitioners. Another interesting feature of the law was the fact that no member of the faculty of any medical college in the state could be appointed to the board.

cal Society, and he attended the thirty-third annual session of the American Medical Association at Saint Paul on June 6, 7, 8 and 9, 1882, as one of the delegates of the Dodge County Medical Society. In January of 1883 Doctor Bliss moved to Claremont in Dodge County.[107] He was interested in Dakota land and occasionally made trips to Dakota. He was licenced to practice medicine in that territory on February 18, 1886.[100] At the time he was listed as being a resident of what is now Raymond, in Clark County, South Dakota. He was never licensed to practice medicine in Minnesota.[40]

In 1896 Doctor Bliss was living in Lake Mills, Wisconsin.[109] When he received a license to practice medicine in Wisconsin on October 17, 1900, he was still living in Lake Mills.[110] The daughter[111] of Doctor Flood could remember the physician who had once been the partner of her father in Mantorville, but she could not remember what happened to him after he left Minnesota. The authors have not been able to discover additional data concerning this physician.

In the early part of 1882, Doctor Gibson, who had been in partnership with Doctor Garver at Dodge Center, moved to a farm near Fairpoint in Goodhue County. He returned to Dodge County in the fall of that year, to settle in Concord, where he was to remain until 1889, with the exception of a short visit to Colorado.

In February of 1882 it was said[112] that Dr. Horace P. Porter of Claremont would sell his drug store and move to Missouri; in March his goods were put up for sale,[113] and shortly thereafter Doctor Porter went to Corning, Missouri. It was noted[114] in November of 1882 that Doctor Porter had returned to Dodge County to visit his brother in Kasson, and it was said that he planned to relocate in Dodge County. In February of 1883, however, he was living in Nebraska,[115] probably in Richardson County or Pawnee County, near the Kansas boundary.

The year 1883 was scarcely under way before **Dr. James McLaughlin** of Mantorville died. A prominent Republican, he was serving in the Minnesota State Senate in Saint Paul when he fell a victim to pneumonia, and this condition, complicated by renal insufficiency of many years' duration, overcame him. He died at the Sherman House in Saint Paul on February 22, 1883[116] at the age of sixty-seven years.

In April of 1883 **Dr. Frederick L. Riser** (1858-1939) opened an office in Kasson,[117] but in August of the same year he went to Lansing, Iowa.[118] There is some evidence that he had been in Kasson in 1877. In neither 1877 nor 1883 did he have the degree of Doctor of Medicine. He did not obtain it until 1884. Possibly the aforementioned "Diploma Law" of 1883 induced him to leave Minnesota in the summer of 1883; at least, he was never licensed to practice medicine in Minnesota.[40]

A **Doctor Wilkins** of Wheaton, Illinois, was said to be "having good success in this vicinity" in a Concord news item in the *Kasson Vindicator*[118] in August of 1883. In the *Kasson Vindicator* for August 30, 1883, a **Doctor Cole** of Mantorville complained of an article that had appeared in a previous issue of that newspaper, but it is not known who he was.

The name of **Dr. Carlos R. Keyes** (1856-1938) a native of Vermont, appeared in the *Kasson Vindicator* during 1883. He was the Byron correspondent of that newspaper, and occasionally his professional notice appeared in the *Vindicator*. He may very well have practiced in Dodge County, but he never lived there. He resided in Byron in Olmsted County until 1891, when he moved to West Duluth.

In a Claremont news item in the *Kasson Vindicator*[119] in September of 1883 it was said that **Dr. Osmon F. Way** (1858-1936) would put in a stock of

drugs in one side of "Nelson's store" in that town. Doctor Way had come from Blooming Prairie in Steele County where he had opened an office after attending lectures at the State University of Iowa College of Medicine. He was a native of Dodge County, and he remained in Claremont for the rest of his life. He did not obtain the degree of Doctor of Medicine until 1891, although he had been licensed to practice medicine in Minnesota on December 31, 1883.[40]

In May of 1884 it was announced that **Dr. William H. Parker** (1859-1913), a native of Iowa, would move from Fairmont in Martin County to Kasson in Dodge County. Instead, he became the partner of Dr. James A. Garver at Dodge Center. He was only twenty-five years old at the time, and had been graduated from the State University of Iowa College of Medicine only about a year previously. Doctor Parker remained in Dodge Center, with Doctor Garver, until about 1887.

In September of 1884 **Dr. H. P. Porter** returned to Kasson from Shubert, Nebraska, to visit his brother.[121] About a month later, it was said that he had obtained a new stock of drugs, and that he would open a pharmacy and practice medicine in Claremont.[122] There is, in fact, ample evidence that Doctor Porter was practicing medicine in Claremont in the fall of 1884, for it is recorded that in November of that year Doctor Porter and Doctor Ranson of Dodge Center brought to **Dr. William W. Mayo** (1819-1911) and his son, **Doctor William J. Mayo** (1861-1939), of Rochester, a patient who had sustained a traumatic stricture of the urethra. The operation by the two Mayos, father and son, evidently was a success. "The after treatment was carefully managed by Doctors Ranson and Porter," the Rochester surgeons reported,[123] "and at last accounts he [the patient] was entirely recovered; urine passing naturally." The operation is of interest because it was one of the first in which Dr. William J. Mayo participated. The date of his graduation as inscribed on his diploma from the University of Michigan Department of Medicine and Surgery is June 23, 1883, but he was in the East for some time after that.

As for Doctor Porter he remained at Claremont until 1886, when he traded his stock of drugs for Kansas land which **Dr. Charles W. Coleman** (1855-1925) owned.[124] Doctor Porter then moved to Kansas with his family,[125] and never again located in Dodge County. It has not been possible to determine his professional activities or his precise movements in Kansas because, as the secretary[126] of the Kansas State Board of Medical Registration and Examination has pointed out, the records of his board do not extend back beyond the year 1901.

At about the time (1884) Doctor Porter was thinking of moving to Claremont, as set forth previously, Doctor Bigelow of Claremont had decided to move to Kansas. In October of 1884 he moved to that state, where he settled in Cloud County. Doctor Porter then took over Doctor Bigelow's practice at Claremont.

During the eighties in Minnesota, and particularly in the years before the Medical Practice Act of 1883 became law, itinerant quacks were common. They infested cities perhaps more than small towns, but many of them soon learned that by visiting certain villages, remaining there for a few days and reaping the harvest of lurid advertisements of their thaumaturgic powers which they had inserted in village newspapers a few days before they actually arrived, they could gain a relatively handsome livelihood. There was no sort of legislation to deter them, and railway facilities were fairly good.

One of these traveling quacks was **Dr. Edward N. Fishblatt** (? -1898), of New Jersey, New York, Chicago and Janesville, Wisconsin. In 1883 and 1884 he was conducting a "Medical & Surgical Institute" at Janesville, but he

also made extensive forays into Minnesota and the Territory of Dakota. He paid for several garish advertisements of his prowess in the *Dodge County Republican,* of Kasson, and excerpts from one of these advertisements, as published in that newspaper on February 28, 1884, will demonstrate his agility in rhetoric.

He claimed to be:

Late Lecturer and Professor in one of the medical colleges in the United States, editor of the New York Medical and Surgical Journal, consulting physician and operative surgeon in the New York Hospital for Chronic diseases.

He said that he:

On account of his Immense Practice in the Western States Has Established a large Medical and Surgical Institute at Janesville, Wisconsin, for the treatment of Chronic Diseases as well as the Diseases of the Nervous System, Heart, Liver, Stomach, and Blood.

He was not unskilled in the literature of terror:

Immediately cured and full vigor restored. This affliction which renders life a burden and, marriage impossible, is the penalty paid by the victim of improper indulgence. Young persons are apt to commit excesses from not being aware of the dreadful consequences that may ensue. Now who that understands this subject will deny that procreation is lost sooner by those falling into improper habits than by the prudent? Besides being deprived of the pleasures of healthy offspring the most serious and DESTRUCTIVE symptoms of both mind and body arise. The system becomes deranged, the physical and mental functions weakened, loss of procreative power, nervous irritability, constitutional debility, wasting of the frame, cough, consumption and death.

SPECIAL NOTICE

Those who reside at a distance desiring the Doctor's service, and cannot call, will receive prompt attention through the mails by writing, stating symptoms, etc., enclosing stamp, when a printed list of questions will be sent.

Address,
DR. FISHBLATT, Medical Dispensary,
Janesville, Wis.

Doctor Fishblatt much later moved to Minneapolis, where he issued such journals as the *Minnesota Medical and Surgical Journal* and the *Northwestern Medical Journal,* as has been shown elsewhere.[127] The editor of the *Dodge County Republican* of Kasson observed in the issue for October 6, 1887, that: "Dr. Fishblatt, the Jewish quack, which visited our village in 1884, has now joined the Salvation Army, where his talents will be better appreciated." There is some doubt as to Dr. Fishblatt's conversion to righteousness in 1887, however, for it is recorded that on August 1, 1887, he was debarred from the practice of medicine in the Territory of Dakota "for gross unprofessional conduct, advertising and quack methods."[100]

(To be continued in July issue)

Editorial

CARL B. DRAKE, M.D., *Editor;* GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

STATE MEETING IN RETROSPECT

THE ninetieth annual session of the Minnesota State Medical Association held in Minneapolis last month surpassed expectations and showed little evidence of any dampening effect by the existence of war. The official record of registration showed 1,205 physicians, 208 exhibitors, 216 Woman's Auxiliary members, 171 nurses and 294 miscellaneous, a total of 2,094.

The banquet at the Minikahda Club was attended by over 500 members and guests in spite of food rationing and the warning given up to the day of the banquet that Congressman Walter H. Judd, the guest speaker, would be detained in Washington. Dr. Judd had reached Milwaukee when he received word to return to Washington. Weather conditions, however, prevented his return by plane and he continued his trip to Minneapolis and electrified the banqueters with his eloquence. It's an ill wind that blows nobody any good. The banqueters also heard President Baxter's address on the timely subject of "The Physician in Civic Life" which appears in this number of MINNESOTA MEDICINE. At the banquet members met Dr. Fernan-Nunez of Milwaukee, who so kindly substituted for Captain Hakansson on short notice, and gave a masterly address Wednesday on "Tropical Diseases" which was much appreciated.

The business of the Council and the House of Delegates was carried out expeditiously for the most part the day before the convention began. The use of reference committees to review and report to the House on various committee reports which has been adopted in recent years, relieves much of the onus of the delegate's job.

The delegates learned at first hand of the efficient activities of the Committee on Public Policy and in detail of the successful opposition to the reappointment by the Governor of Mr. Debel on the Workmen's Compensation Commission.

The physicians of Minnesota have the firm conviction that free choice of physician is not only one of the freedoms in a free country, but is one of the essential cornerstones of competitive practice. No one can deny that competition is conducive to better medical service. For this reason extension of practice beyond the sphere of so-called private practice is opposed.

The law in Minnesota specifically provides free choice of physician to workers coming under the Workmen's Compensation Law. Mr. Debel did not carry out the provision of this law and for this reason his reappointment was opposed, and successfully opposed. The officers of the State Medical Association appeared in the matter before the Senate Committee on Workmen's Compensation and conferred with the Governor, and the profession throughout the state in great numbers communicated their stand to the Senate Committee. It was unfortunate that the difference of opinion became so acrimonious and that the Governor accused the profession of using intimidating methods. The whole affair, however, should make it perfectly apparent that the profession of the state is prepared to fight for their convictions.

The delegates heard from Dr. Savage, chairman of the Committee on Interprofessional Relations, about the efforts of this committee in conference with the State Board of Nurses Examiners, the State Board of Health, the State Nurses Association and the Hospital Association to provide for the training of Nursing Aides. The war has only accentuated the need for young women with some training in nursing to assist in the care of the sick at home and in the hospital. The committee favors a nine months' course of training along lines to be outlined by a special committee of nurses known as the Acorns (Advisory Committee on Rural Nursing Service) in hospitals of twenty-five beds or more and the granting of certificates by the hospitals. Questionnaires have already been sent out to the hospitals concerned, and the main stumbling block so far has been that this special training will not be credited for further training as a Registered Nurse. Dr. Kurten, president of the Wisconsin State Medical Association, who was present at the meeting of delegates, stated that in

Wisconsin similar legislative provision had been made for Nurse's Attendant with a year's training in a hospital of forty beds or over.

Probably the most important action taken by the delegates was the approval of a resolution, and its submission by our delegates to the A.M.A. House of Delegates in Chicago, June 7. The resolution provides for the establishment of a Committee on Medical Service representing various sections of the country, with headquarters in Washington, which shall provide a source of information on medical matters. The resolution is the result of the presentation of the need for such an office in our national Capitol by Dr. A. W. Adson at the National Conference on Medical Service in Chicago last February. This address was published in the April number (p. 352) of MINNESOTA MEDICINE.

The delegates elected the following officers for 1944:

President: Dr. E. M. Jones, Saint Paul

1st Vice President: Dr. R. R. Cranmer, Minneapolis

2nd Vice President: Dr. M. S. Nelson, Granite Falls

Treasurer: Dr. W. H. Condit, Minneapolis (reëlected)

Secretary: Dr. B. B. Souster, Saint Paul (reëlected)

Speaker of the House: Dr. W. W. Will, Bertha (re-elected)

Vice Speaker: Dr. E. A. Meyerding, Saint Paul (re-elected)

A.M.A. Delegate: Dr. F. J. Savage, Saint Paul (re-elected)

Alternate: Dr. George Earl, Saint Paul (reëlected)

A.M.A. Delegate: Dr. J. M. Hayes, Minneapolis (re-elected)

Alternate: Dr. W. W. Will, Bertha

The annual meeting in 1944 will be held in Rochester, Minnesota, at a time to be designated by the Council.

MORE DOCTORS NEEDED FOR ARMED FORCES

AT the request of the Chairman of the National Procurement and Assignment Service for Physicians, Dentists and Veterinarians, we are publishing in this issue statements of needs by the Surgeons-General of the Army, Navy and United States Public Health Service, as well as one outlining the present situation by the Chairman.

The procurement of enough physicians for the various services has been undertaken by the professions of medicine, dentistry, and veterinary. The figures for 1942 speak for themselves. The medical profession has good reason to be proud of the result. The only possible exception is the showing made by the physicians of the states of Massachusetts, Connecticut and New York. In these populous states there are more physicians per unit of population than in most other states. We are not pointing the finger of scorn at the profession of these three states, but we do wonder what the explanation of this apparent backwardness is.

There are 2,497 physicians living in Minnesota and of these 2253 are now members of the Minnesota State Medical Association. This last figure includes the Fellows at the Mayo Clinic, but not hospital interns nor residents. At present there are 1,629 physicians in active practice in the state.

Minnesota supplied its quota of physicians for 1942 by 105 per cent. The quota for 1943 is an additional 276 at the rate of twenty-seven a month. Even by taking credit for the 5 per cent over-enlistment last year, our enlistment is lagging.

The various services want to recruit only physicians under the age of forty-five. Our State Procurement and Assignment Committee has certified 106 under the age of thirty-eight and 131 between the ages of thirty-eight and forty-five as available. This total of 237 is below the quota desired.

There is some reason for believing that our quota is too high, as it does not take into consideration that two-thirds of the medical work done at The Mayo Clinic is furnished individuals who live outside the state. However that may be, the need of the various services is great. Our country districts have been drawn upon to the limit and enlistments this year will have to be drawn from urban centers.

These facts make it clear who must make the sacrifice financially and otherwise to make up our quota. The armed forces must have physicians to care for the health of men who are serving their country and need more medical service per unit of population than civilians. Those physicians who have already joined have proven their patriotism. More patriots are needed.

DANGER FROM FLUOROSCOPY

A NUMBER of articles have been published concerning the dangers connected with fluoroscopy. Recent measurements have shown that these warnings must be taken seriously and that they concern the whole medical profession. The problem is more acute now when the serious film shortage may call for more extensive use of the fluoroscopic method, and it seems advisable to call attention to a few pertinent facts.

No fluoroscopic unit should be used unless the doctor in charge has convinced himself that the conditions under which it is operated are reasonably safe. A continuous vigilance is necessary, and it is not enough to know that the conditions were satisfactory at one time in the past.

A shock-proofed arrangement should remove electrical dangers but a broken cable or a casual repair may lead to electrical hazards, and many of the old machines have exposed high-voltage leads. Grounding a part of the apparatus may not always serve as protection, and if the ground is applied at the wrong place the danger may be increased. A careful expert inspection is needed and there can be no valid excuse for an accidental electrocution though such accidents have occurred a number of times.

Roentgen rays from fluoroscopic units have caused innumerable sequelæ to both patients and physicians, and serious damages are often still produced in spite of the knowledge that now is available.

In order to obtain adequate protection, it is first required that the tube is shielded so that no radiation of any consequence escapes in any direction except in the useful beam. This may be checked roughly with a hand fluoroscope or more accurately with a roentgen meter with a sensitivity of 0.01 r or a Geiger-Muller Counter. After this first requirement has been fulfilled several other precautions must be taken.

For any intelligent use of fluoroscopy, it is important to know the amount of roentgen rays reaching the skin of the patient and of the examiner, and that has to be determined by means of measurements. The total dose received depends upon the intensity and the time of exposure. The intensity depends upon a number of factors and varies widely in practice. A reasonable intensity at the skin of the patient nearest to the tube amounts to about 20 r per minute.

Mr. Marvin, of the division of Biophysics, University Hospitals, has recently checked some machines in Minnesota, and has found intensities during routine practice up to 114 r per minute. It is evident that such an intensity is dangerous and must be reduced by proper adjustments. The question is how many of the machines which have never been calibrated are used under similar conditions with an unnecessarily high intensity.

The intensity may be reduced by increasing the distance from the target to the patient. This distance should be at least 28 to 30 cm. It can also be reduced by lowering the current which should not exceed 4 to 5 ma. If the fluorescence is not bright enough the voltage may be raised and it is advisable to use rather high voltage, preferably 80 kv. or 100 kv. if possible with the equipment. With a high voltage a filter helps to lower the intensity considerably and a 1 mm. aluminum filter should be permanently attached.

With the use of 28 cm. target skin distance, 90 kilovolts and 4 ma. and 1 mm. aluminum filter, the intensity can undoubtedly be kept within the safe range, but it is still advisable to have it measured so that the number of roentgens applied per minute will be known.

The time used for an examination should be kept at a minimum. It should be measured and recorded. A foot switch should be used so that the current applied to the tube may be limited to the time of inspection. The use of a timer which sums up the exposure and shuts off the machine when the dose has been given was decided on, is advisable.

Some fluoroscopic examinations require an exposure of 5 minutes. With an intensity of 20 r at the patient's skin, this means a dose of 100 roentgens. A dose of 75 r is often used for treatments of skin diseases and the title of a publication in *The Journal of Radiology*, "Roentgen Therapy in Fluoroscopy" is, therefore, no exaggeration.

The rules laid down here for the safety of the patient may seem drastic. They are, however, not difficult to follow after they once have been accepted and certainly the patients have the right to expect of the physician that he takes the necessary precautions in order to avoid a serious injury from a simple examination. These rules also help to protect the examiner, though any injury to him is due to accumulation of exposure over a long time rather than to a single dose. He must be particularly careful to protect the hands

which are inevitably exposed at palpation during the fluoroscopic examination. The use of lead-rubber gloves may help but not unless the gloves are heavy and designed to shield the whole hand can they be relied upon to give complete protection. Light gloves may give a false sense of security. The examiner must in any case be aware of the danger and take all precautions possible.

The most dangerous procedure and the one which has caused most of the injuries is the setting of fractures under fluoroscopic visualization. This practice must be condemned and the radiologist in charge should enforce the rule that nobody on the staff be permitted to use the apparatus in this manner. The doctor may receive enough exposure from the setting of a single fracture to produce a severe skin reaction. It is, of course, good practice to inspect the position fluoroscopically and that can be done several times without exceeding the permissible total dose.

I have seen a number of physicians who have suffered the consequences of too much exposure during fluoroscopy. They have been severely handicapped, and at least one of them has already paid with his life. The tragedy has been extremely impressive, and it is hoped that others will heed the warnings before it is too late.

K. Wilhelm Stenstrom, Ph.D.
Professor of Biophysics,
University of Minnesota

DEATH RATE IS RISING: PNEUMONIA WORRISOME

The death rate is rising and the pneumonia situation is particularly worrisome, it appears from the Statistical Bulletin of the Metropolitan Life Insurance Company.

A 5.5 per cent increase in mortality among the company's industrial policyholders was recorded for the first quarter of this year as compared with last year's figure. For the country as a whole, an even greater rise in mortality has probably occurred. In the ninety major cities of the United States there were 9.2 per cent more deaths reported for the first 13 weeks of 1943 than for the corresponding weeks of 1942. In New York City the death rate so far this year is about 8.5 per cent higher than for the same period last year.

The war cannot be blamed directly for the increase in mortality, it appears. Among the company's industrial policyholders, the rate for deaths from enemy action for the first quarter of 1943 was more than twice that for the first quarter of 1942, but this, it is said, "does not account for the unfavorable turn in mortality for 1943. Most of the rise in rate this year has resulted from other causes."

Pneumonia seems to be the chief factor. The death rate for the first quarter of 1943 is low compared with rates prior to 1941, but is 21 per cent higher than last year's rate for the first quarter. Virus pneumonia, also called "atypical pneumonia of unknown etiology," has made up a large proportion of pneumonia cases during the past season, and this type of pneumonia is not affected by sulfa drug treatment.

Seeking to allay the fear that the rise in the pneumonia death rate presages another world-wide flu-pneumonia epidemic, the Metropolitan Life Insurance Company health authorities point out that virus pneumonia is different from both influenza and the pneumonia which accompanied influenza in 1918.

"Nevertheless, the situation needs careful watching," they state.

"The war effort would be seriously hampered by an increase in pneumonia mortality or even by a continuation of the recent level."

Meningitis mortality also increased sharply in 1943. Disquieting also is the increase in deaths from cancer, diabetes, cerebral hemorrhage, diseases of the coronary arteries and angina pectoris and the chronic heart diseases. With the exception of diabetes, the 1943 death rates for all of these are the highest on record.

Fatal accidents in the home have increased, in spite of the fact that there is very little unemployment and less time is spent in the home now than before the war.

Only cheerful spots on the current health picture are the marked decline in maternal mortality, especially noteworthy in view of the increased birthrate, and the continued decline in the tuberculosis death rate which was 6.8 per cent less in the first quarter of 1943 than in the same period last year.—*Science News Letter,* May 15, 1943.

NEW SULFA DRUG IS TWO TO FOUR TIMES AS POTENT

A new sulfa drug has been developed which promises to be a more potent weapon against intestinal infections, such as dysentery, than its predecessors in the sulfa family. Phythalylsulfathiazole is its name. It is announced in a report by Dr. Edgar J. Poth and Dr. Charles A. Ross, of the University of Texas Medical School to the Society for Pharmacology and Experimental Therapeutics.

It has two to four times the germ-checking power of succinylsulfathiazole. Doses by mouth at four-hour intervals have not caused any toxic symptoms in dog or man.—*Science News Letter,* May 15, 1943.

JAPS GET MONOPOLY OF GINSENG GROWING

The Japanese government is even in the patent-medicine racket. In Korea, it exercises monopolistic control over the cultivation of ginseng, a sarsaparilla-like plant whose root, dried, shaved up and made into a tea, is considered good for whatever ails you by millions of Chinese and Japanese. By making a monopoly of it, and forcing the Koreans to grow it at coolies' wages, the smart little brown men cut a profit both ways.

There was a short-lived boom in the cultivation of the American species of ginseng about a generation ago, but because of low-cost competition in the Orient it collapsed. The American and Asiatic ginsengs look very much alike, but are distinct species.—*Science News Letter,* February 27, 1943.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

A MEDICAL CONGRESSMAN REPORTS TO HIS COLLEAGUES

Dr. Walter H. Judd made his first home appearance since he took his seat as newly elected congressman from the Fifth District, at the Minikahda Club in Minneapolis, Tuesday, May 18, as guest speaker at the ninetieth annual dinner of the Minnesota State Medical Association.

The dining rooms of the club were packed to capacity for the occasion and many more who had sought in vain for tickets to the dinner were admitted to standing room in the rear. They were rewarded by a report which, for its wit and frankness, its earnestness and timeliness will undoubtedly go down as unique in the annals of the association dinners.

The excerpts which follow will indicate to some extent the extraordinary character of the address. It is to be hoped that Dr. Judd's advice will be soberly heeded by his medical colleagues in Minnesota.

Said Congressman Judd:

I am very happy to have this opportunity to make my first home appearance before my colleagues. This will be in the nature of a case report and a clinic. It is addressed to you, first, as doctors and, second, as citizens.

Medicine Praised

First, I want to say now that we do not realize what an outstanding job we have done in this war, as doctors. I didn"t realize it, myself, until I saw so many others, down there, in Washington, taking advantage of the war crisis to increase their own preference, standing and power. Not a single profession nor a single trade has organized itself as medicine has, seeing the need ahead even before the Army, Navy or Selective Service saw it, and working out in advance the fundamentals of providing medical service for the maimed in this war. There has been criticism, of course. Politicians took it for granted that doctors were like themselves and some of them even declared that the reason doctors were seeing to it that a sufficient number applied for service was that the older men were getting rid of the young men who endangered their practice that way. They couldn't believe, naturally, that anyone could sacrifice his personal interests for the sake of the sick and wounded of his country. It is discouraging, indeed, how few people there are in Washington who are capable of rising to the ideals which normally actuate the doctor.

Acute Problem

The war, of course, has created an acute problem in medical service. First the Army demanded 7.5 doctors to every 1,000 men. They have modified that demand to a ratio of approximately six per 1,000. But the lack of coördination and wisdom in Army planing for medical service has been disturbing. For instance, our own General Hospital Unit No. 26 sat and rotted for eight months before any use at all was made of its skilled medical personnel. There are many instances even more flagrant. The reason for it lay in bad planning, to begin with, and in unfortunate competition between military departments and the various arms of the service, each one striving for more and more men, regardless of over-all needs, and of the immediate uses to which they are to be put. Such striving is a characteristic of Washington, to be sure, and not confined to the Army. There are sections of the State Department, I am told, which haven't spoken to each other in years, though they speak about each other frequently and loudly. Medicine, I am glad to say, is head and shoulders above that kind of petty contentiousness.

No Epidemics Yet

Now, the point of this doctor situation is this: We have had the good breaks lately. We have been freer of epidemics in the last six months than at any time for which there are records. In 1942 there was not even the usual seasonal rise in the respiratory infections.

But one day we will get an epidemic. And you know, as well as I do, that we won't be able to stand a big epidemic on the basis of our present distribution of doctors.

The Doctor's Job

It is our job, therefore, to work out the problem of distribution more equitably before, not after, the epidemic comes.

Part of our problem in public health today arises

out of our very progress. There is no more enlightenment about the fundamental needs for health and there is a greater demand for hospitals, though in Washington today, not even the President's daughter could get more than four days, in case of childbirth, in any hospital in the city.

There are going to be great changes affecting medicine after the war. There is no doubt of it. And I want to see our profession right up in the front lines directing and shaping those changes. Certainly, neither you nor I want the professional philanthropists spinning out the alterations and calling the turn, though that is just exactly what will happen unless we take it over.

Danger in "Old Guard"

There are two dangerous factions in medicine as you know. One is the Old Guard which says that things must stay as they are. And there is the radical section that wants to scrap the entire system and start over. Neither of those factions can do this job.

If medicine just sits back and resists, resists, resists—the professional reformers are going to ride roughshod over our bodies and nothing can save our precious freedom.

There are borderline cases where help is needed. We all know and must recognize that. There are areas of maldistribution where action must be taken now. And it is a fact, too, that there are not enough doctors for this emergency. It's just a case for rationing, like sugar and meat. I want the medical profession to do its own job of rationing. If we don't, it's certain that the "smart" boys will.

Larger Responsibility

We've done a fine job already in this war and before. But out of it comes a greater responsibility. We can accept and carry that responsibility. What we have to fear in so doing, is the "diehards" on the one hand, who will hang back, and the scrappers on the other who want to give everything for nothing. Here is a case in point.

When I went to China, western doctors had been there forty years and still there were no Chinese students studying medicine. Chinese boys were studying law, economics, trades, however, and so I asked a Chinese father one day why he was not educating any of his sons for medicine. "We can't afford it," the father said. "We can't possibly meet the competition of the mission hospitals where everything is given free."

Exploiting the Chinese

You know that many missionaries went to China just to get stars for their own crowns—and at the expense of the poor Chinese. They measured achievement in terms of what they could give away and not in the solid lasting good they could do. They overlooked the fact that, if a medical system in China or anywhere else is not self-supporting, it is not sound. The Rockefeller Foundation made that mistake initially when it established a medical center in Pekin, for instance, which is one of the best in the world. The Chinese knew they couldn't approach what the Foundation had done, so naturally they gave up at the start and did nothing. We were trying to import and force upon them a model which it was impossible for them to reach. We forgot that self-respect and independence are engendered only when you pay your own way and those qualities are enormously more valuable than anything you can hand out to people. You don't build personality or self-respect by giving things and making people take them.

We Ask for Payment

In our own hospital we came to realize that truth and we began to ask payment for our services. The amounts were small and they were adjusted to what the people could pay, but it made all the difference in the world in the attitude of our people and the effectiveness of our service. We were not popular for it, either, with the old missionaries.

Like the missionaries, the people in our government at Washington do not always understand what constitutes real help. They forget that the objects of their assistance are human beings, with a human being's ambitions and yearnings for prestige.

Washington Headquarters Needed

We doctors have known that always, but we've been too modest to say so. We must remember, though, that the "smart boys" are not modest. They are quite willing to go ahead without advice. And the fact is there has been nobody, up to date, to advise them. I was amazed when I went to Washington, myself, to find that there were no headquarters anywhere in Washington where either the Congress or the departments or agencies could get authoritative advice on medical matters. Small wonder that they have made mistakes, and such mistakes are serious. It's the hardest thing in the world to correct a mistake once it is enacted into law by the Congress and even harder once it has been publicly released as a departmental directive.

What we medical men must do is to establish a headquarters and provide advice on the spot in Washington, not in the sense of lobbying at all, but with the object of giving counsel. You know, most of us in Congress are trying to do right, at least if our own interests aren't too seriously involved. But we need help and the medical profession must provide it.

Congress' Doctors Get Together

There are now seven of us doctors in Congress, by the way.

All of us got together, a while back, in the hope of fostering some sort of over-all scheme to take care of the medical situation. We hoped, at least, to be on the inside so as to survey the situation in the hospitals, in the Army and the Navy and Public Health Service and make an over-all plan. But we didn't get anywhere.

The Public Health Service was interested but the Army said nothing doing and the Navy was even more reluctant. Each group wants the men and the

power and neither will give way to the others. It is the same with many government agencies in Washington.

In fact, I am convinced that what we need most in Washington is more doctors in government and, above all, more of the kind of mental habits that good doctors must have.

We Need to Study Failures

First let us say we need the *autopsy type of mind* which is willing to look at its own failures and accept them without hunting around for a scapegoat. We need the type of mind which is willing to study its failures and ask itself questions so as to avoid the same failures in the future. If the trouble is in the stomach or liver, it makes no difference to the doctor whether the patient is a republican or a democrat; it is still in the stomach or the liver.

Did We Think It Was Harmless?

Second, we need the *biopsy type of mind.* In medicine we don't wait for the malignant growth to kill the patient before we do something about it. We take a sample of the growth as early as possible to see how those cells are growing. We don't say: "Oh, it's only in the toe. Let's wait until it gets to the knee to find out how it's going to spread." But in government and politics we have been doing just that. We saw what happened in Manchuria in the East and to the Jews in the West. But we waited until the growth spread to Pearl Habor. We knew it was malignant at the start. Did we think its malignancy would disappear and it would suddenly become harmless and benign when it reached us?

Third, we need the *type of mind which deals with things impersonally.* We doctors may argue about the need for an operation and one of us may lose the argument. But both of us want to see the patient get well. It is discouraging in the extreme that so many men in Washington should care so much less about seeing the patient get well than about their own vanities. They are afraid of this and afraid of that until finally they become afflicted by a kind of dry rot. They are all stooped over from keeping their ears to the ground.

Nobody Can Smear Congress

You know they try to keep a Congressman silent during his first year, knowing well that he will atrophy if they do. Soon he will acquire the universal spirit of looking out for himself first.

Save me from that! I am fortunate in having a profession for the future and no need to think about holding my job. So I am going to have a good time and do what I like. If I am sound, I believe the people will agree with me. If I am in error, it will be over in two years before the dry rot creeps up on me.

There is a great deal of talk about "smearing Congress." The fact is that nobody can smear Congress as much as Congress smears itself. A young friend on leave from the Army visited the House one day and he was amazed at what he heard there. "Imagine an Army," he said to me, "as disorganized as that."

We have no right to be as disorganized as we are. Of course we are bound to get undeserved blame and undeserved praise. Doctors get it every day, understand it and let it pass. Congress must have the same detachment.

No Sense of Balance

Fourth, we must have *the habit of thinking in terms of alternatives.* As it is, we have no sense of balance in Washington. We take a course of action and it turns out to be a mistake. What do we do? We scrap the whole thing. We do not try to save what is good and substitute other measures for what is manifestly bad. Furthermore, we think only for the present, in the present. We consider how to get rid of the ruins before the building is completed and not at all in terms of building for posterity. In fact, this generation is not living in terms of posterity at all. And yet the truth is, in government as well as in medicine, that nothing we do is worth anything unless we are building for the future.

Whether we like it or not—whether we are ready for it or not—we are now on the threshold of a new world. Our future is quite likely to be decided for a generation or more in the next six months.

If we doctors take our share of the general responsibility, if we work as a team now, perhaps we can help find an answer that will last to the question: How are we going to live in this new world?

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. Du Bois, M.D., Secretary

Minneapolis Abortionists Plead Guilty to Manslaughter

Re State of Minnesota vs. Edward H. Stanton.
Re State of Minnesota vs. Mrs. Anna Huff.

On May 17, 1943, Edward H. Stanton, forty-one years of age, and Mrs. Anna Huff, sixty-one years of age, pleaded guilty in the District Court of Ramsey County to the crime of manslaughter in the second degree. Stanton, because of a prior conviction, was sentenced to a term of two to five years at hard labor in the State Prison at Stillwater. Mrs. Huff was sentenced to a term of up to five years at hard labor in the Women's Reformatory at Shakopee. Both sentences were imposed by the Hon. Gustavus Loevinger, Judge of the District Court.

Both defendants were arrested on April 24, 1943, by the Saint Paul Police Department, following information furnished to the Minnesota State Board of Medical Examiners that a Saint Cloud woman was in a dying condition at Midway Hospital in Saint Paul following an alleged criminal abortion. The investigation disclosed that the patient had been aborted by the defendant Stanton at the defendant Huff's residence, 2027 Sheridan Avenue North, Minneapolis. When it became apparent to the defendants that the patient was critically ill, the patient was taken to a Saint Paul physician; a second physician was called in consultation and the facts brought to the attention of the Minnesota State Board of Medical Examiners. The patient died the next morning.

Stanton admitted to the Court that he had performed between twenty and twenty-five criminal abortions at Mrs. Huff's residence, the money usually being paid to Mrs. Huff, who retained the greater portion of it. In the present case, $100 was paid to Mrs. Huff who retained $90.00, giving Stanton only $10.00. Stanton stated that from 1935 to 1939 he was employed as a male nurse and orderly at the University Hospital in Minneapolis. He also stated that for several months in 1941, he was employed in a similar capacity at Minneapolis General Hospital. From 1925 to 1930 Stanton stated to the Court that he was a member of the Minneapolis Fire Department. Stanton claims that he was born near Red Wing, Minnesota, and that he is of one-eighth Indian blood. Mrs. Huff told the Court that she was born in 1881 in Sweden, married three times and all three husbands disappeared. She claims to have had some training as a practical nurse, and that for the past seven or eight years she has taken care of girls and married women who were aborted in her home. She named several individuals as having performed criminal abortions at her home. One of these individuals is dead and another one is now serving time in the State Prison at Stillwater. Ordinarily, the defendants would have been prosecuted in Hennepin County, but because of the death of the patient in Ramsey County, the law permits the prosecution to be had in either county. The splendid results obtained in these two cases are due, in no small part, to the prompt and efficient work done by the Saint Paul Police Department and the Ramsey County Attorney's office.

License of Minnesota Physician Suspended Following Conviction at Portland, Oregon

Re: Revocation of the License of Herman J. Holte, M.D.

Following a hearing held on February 13, 1943, the Minnesota State Board of Medical Examiners suspended, for a period of five years, the license to practice medicine formerly held by Herman James Holte, forty-two years of age. Dr. Holte pleaded guilty in the Municipal Court of Portland, Oregon, on June 29, 1942, to the crime of petit larceny. He was sentenced to 180 days in the Multnomah County Jail. On the same date he also pleaded guilty in the same Court to a charge of drunkenness and was sentenced to a term of thirty days in the Portland City Jail. Because Dr. Holte's services were needed at the Eastern Oregon State Tuberculosis Hospital at The Dalles, Oregon, he was paroled by Judge Quillin on August 7, 1942. However, on August 29, 1942, Dr. Holte was again arrested in Portland as a parole violator, and for drinking on the street, and on August 31, 1942, Judge Quillin revoked Dr. Holte's parole and ordered him to serve the balance of his previous sentence and thirty days additional, plus a fine of $40.00. Judge Quillin also ordered that if the fine was not paid, that Dr. Holte serve an additional fifty days.

Dr. Holte graduated from the University of Minnesota with a degree of Bachelor of Medicine in 1929. He received his Doctor of Medicine Degree in 1931. He was licensed to practice medicine in Minnesota on February 4, 1930, by examination. Dr. Holte practiced medicine for short periods of time in the State of Washington, and also in Minnesota. Prior to being arrested in Portland, Oregon, Dr. Holte was arrested on numerous occasions for drunkenness. Several attempts were made by Dr. Holte's friends to have him abstain from the use of intoxicating liquor, and the Minnesota State Board of Medical Examiners coöperated in every way in these efforts. Dr. Holte did very well for a time, but again reverted to his old habits leaving the Medical Board with no alternative except to suspend his Minnesota license.

Manitoba Physician Loses Minnesota License Following Conviction

Re: Revocation of the License of Robert William Henry Guilmette, M.D.

The Minnesota State Board of Medical Examiners suspended, for a period of five years, the Minnesota license to practice medicine, formerly held by Robert William Henry Guilmette, M.D., of Berens River, Manitoba, Canada. At a hearing held on February 13, 1943, evidence was presented to the Medical Board showing that Dr. Guilmette pleaded guilty on the 27th day of March, 1941, at Winnipeg, Manitoba, to violating "The Opium and Narcotic Drug Act of 1929, of the Dominion of Canada." The specific charge was that Dr. Guilmette executed a prescription to himself for a narcotic drug, the drug not being required for medicinal purposes. Dr. Guilmette's name was erased from the Medical Register of the College of Physicians and Surgeons of Manitoba on May 14, 1941, because of his conviction.

Dr. Guilmette was born at Winnipeg, Manitoba, in 1879. He obtained his Medical Degree from the University of Manitoba in 1907 and was licensed to practice medicine in Minnesota in 1912, by examination. Dr. Guilmette practiced in several communities in Minnesota, returning to Winnipeg where he registered in January, 1932.

Habitual Drunkenness Leads to Revocation of Minnesota Physician's License

Re: Revocation of the License of Robert F. Werner, M.D.

At a meeting of the Minnesota State Board of Medical Examiners held on April 10, 1943, the license to practice medicine formerly held by Robert Frederic Werner, M.D., was permanently revoked. Dr. Werner, who is only forty-two years of age, has a long record of habitual indulgence in the use of intoxicating liquor. Dr. Werner was an inmate of the Willmar State Hospital on five different occasions for alcoholism; the first time in 1934, three times in 1936, and again in 1942. On December 12, 1940, Dr. Werner's license to practice medicine was suspended for a period of five years because of habitual indulgence in the use of morphine sulphate and other derivatives of opium. While this suspension was in effect, Dr. Werner was arrested in Minneapolis for checking on a bank without sufficient funds. On January 8, 1942, he was sentenced to one year in the Minneapolis Workhouse for that offense. Shortly thereafter he was committed, as an inebriate, to the Willmar State Hospital by the Probate Court of Hennepin County. Dr. Werner made splendid progress while undergoing treatment at Willmar and, due to the necessity of additional medical care at the Hospital, the Medical Board terminated the suspension, previously imposed, of Dr. Werner's license, upon the express condition that he refrain from the use of alcoholic liquor and upon his further promise to remain at the Hospital for one year as a physician employe. Dr. Werner violated his promise shortly thereafter by becoming intoxicated and finally abandoning his work.

Dr. Werner graduated from the University of Minnesota, receiving his Bachelor of Medicine degree in 1926. He was licensed the same year by examination and has practiced medicine at International Falls and Herman, Minnesota, and other communities for short periods of time.

War Bulletins

STATEMENT OF CHAIRMAN, DIRECTING BOARD PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

Figures are now complete on the 1942 quotas for supplying physicians of the various states. Forty states have exceeded the 100 per cent figure of their quotas. Five states were above 90 per cent of their quotas. Four states—New York, Connecticut, Massachusetts, and Nevada—were below 90 per cent of their quotas.

Nevada is the lowest state, but has a total quota of but thirty-five doctors. It has provided twenty-three and deserves special consideration because its population is thinly scattered over wide areas.

This statement would not imply any reflection on the patriotism of those members of the medical profession who have been marked available by the Procurement and Assignment Service in these three states and who have not sought a commission. I would only present the facts and let each one draw from these facts whatever deductions he individually chooses.

Certain unavoidable considerations must be faced in these figures. Four states failed to provide 90 per cent of their 1942 quotas of doctors for the services. Three of these states—New York, Connecticut, and Massachusetts, are Eastern Seaboard States and among the most populous ones in the Union. These populous states have large cities in them which now have more doctors per thousand persons than most other parts of the country. Largely because those doctors marked available by the Procurement and Assignment Service have not sought commissions these states are below their quotas.

Unless more of the doctors found available for military service by the Procurement and Assignment Service in these cities apply for a commission in the armed forces with reasonable promptness still more doctors must come from rural communities. This will greatly complicate the problem for those communities in their own and other states since many rural communities are already none too well supplied with doctors. Such inequalities in medical service as now exist become practically insurmountable for the Procurement and Assignment Service with its present limited authority. With all these facts in mind, with the responsibility of medicine to the country and to itself such as it is, the quota figures should be brought up to par by an intensive effort of the State Medical Societies through their executive bodies preferably by an organized State Medical Society campaign.

The provision of doctors for the armed forces is not only the special obligation of medicine but a responsibility which it acknowledges and accepts as its part in the war effort. Each state that has not met its 1942 quota will be kept informed of its position in relation to its quota and its position in relation to other states.

STATEMENT OF THE SURGEON GENERAL OF THE UNITED STATES ARMY

The Army is increasing in size; more medical officers are required. New units are being formed and many new general hospitals are under construction at many points in the United States. Some basic training must be given to medical officers before they are assigned to purely medico-military duties; for this reason, they are needed one or two months prior to actual assignment. For the protection of the health of the civilian population, the quotas for physicians must be fairly distributed throughout the country. Certain states are far behind; they will, it is hoped, do everything possible to furnish their quotas at once.

STATEMENT OF THE SURGEON GENERAL OF THE UNITED STATES NAVY

In order to plan intelligently I have reviewed the personnel situation in the Medical Department of the Navy. There is a deficit of approximately 900 medical officers for the next six months, based on minimal requirements. The Bureau of Medicine and Surgery calls medical officers to active duty when billets are available, does not build up too large a Reserve at any time. Consequently, procurement must go on in an orderly fashion, if we are to meet the demands that will be placed upon us as the offensive fighting develops. We can not afford to have the deficit increase beyond its present level; if it does we will not be able to give first-class medical service to our wounded.

The Medical Department of the Navy is charged with maintaining the health of all the personnel of the Navy and the Marine Corps; in addition it must care for the dependents of the officers and men. We look to the medical profession of our nation to come forward with the available doctors that can be spared from civil life to aid in our military necessity. In the main, the profession has responded nobly. There are some localities where this is not so. In those localities the medical profession should cause the pressure of public opinion to bear on all eligible doctors and thereby bring to their attention the seriousness of failing to do their patriotic duty.

The medical profession is faced with a challenge of furnishing medical service to the Armed Forces and to the civil population during the active state of war and in the postwar period, which we hope is not too far distant. Should the profession fail in either regard many forces may develop that will destroy the practice of medicine as we know it. This would be disastrous and it is something that we can not afford to allow to come about. In all seriousness, the doctors of medicine in the United States should take stock carefully of their own immediate situations and should give every assistance in planning to see that medicine plays its responsible part in this and coming years.

STATEMENT OF THE SURGEON GENERAL OF THE U. S. PUBLIC HEALTH SERVICE

During the next twelve months, the Public Health Service will require approximately 600 medical officers for full-time active duty in the reserve commissioned corps. These physicians will be recruited on an average of fifty a month—twenty-five for service in the U. S. Coast Guard, and twenty-five for general service.

In addition to the medical officers assigned to the Coast Guard, physicians are needed for duty in the Marine Hospitals and the medical program of the War Shipping Administration, as well as for detail to general public health work in State and local health departments, and for such specialized war programs of the Public Health Service as tuberculosis control, venereal disease control, industrial hygiene, and community medical services.

The Service also expects this year to commission some 5,000 physicians in the inactive reserve. These doctors will be available for active duty in the event of acute emergency in their own or nearby communities. They will not be called for active duty unless an acute emergency exists, and will be retained only for the duration of such an emergency. This recruitment of inactive officers is undertaken as a part of the coöperative program of the Public Health Service and the Office of Civilian Defense.

The needs of state and local health departments for physicians have increased greatly during the past year.

In January, 1942, it was estimated that state and local health departments would need 600 physicians. As of January, 1943, the exact needs have not been determined, but the Public Health Service has, at the present time, requests from the states for 185 medical officers to be assigned to duty in war areas alone.

According to reports from State Procurement and Assignment chairmen, as of March 23, 1943, 286 additional doctors for civilian practice are needed in 176 counties located in thirty-eight states. Another twenty-two counties in the same states report a shortage of physicians but do not specify the numbers needed. In the remaining ten states, no needs were reported.

These 198 counties reporting immediate needs represent only 7 per cent of the 2,654 counties in the thirty-eight states, and only 6 per cent of all counties in the country. Nevertheless, it is apparent that civilian communities are feeling the pinch of the physician-shortage increasingly, since experience has shown that local needs become acute before they are expressed in formal reports. In the joint studies made in forty-two areas by the Public Health Service and the Procurement and Assignment Service, it has been determined that fifty-nine physicians and five dentists, or sixty-four medical and dental personnel, are needed in these areas—an average of 1.5 per study. The Public Health Service has been requested to supply thirteen of these physicians and dentists, or 23 per cent of the determined need.

On the basis of these forty-two studies, it is estimated that 500 physicians and dentists will be needed in 332 areas to be surveyed in the next coming fourteen months, or by June 1, 1944. It is anticipated that 60 per cent of these, or 400, will be supplied by voluntary relocation through the regular channels of Procurement and Assignment, and that the Public Health Service will be requested to assist in meeting the needs for the remaining 20 per cent, or 100 physicians and dentists. This may be done either through financial assistance to physicians desiring to relocate in areas requiring their services, or through assignment of Public Health Service personnel upon request of the proper authorities.

Although it is impossible to project with accuracy the 1943 needs of civilian communities, we must face the fact that the shortage undoubtedly will increase during and after the filling of the 1943 military quotas; and that the chances of meeting civilian needs as well as replacing physicians who die or withdraw from practice because of disability, will correspondingly decrease. Furthermore, we cannot predict at this time the possible needs of certain rural areas, which now may be adequately supplied but which will require additional public health and medical services during 1943, should the Government move a large number of farm families into these areas for the food production drive. It is believed that joint action of the Public Health Service and the Procurement and Assignment Service will serve to meet urgent needs in civilian communities.

MORE THAN 97 PER CENT RECOVER

More than 97 per cent of Navy and Marine wounded have recovered; incomplete data on the Army show that there has been a like recovery of wounded soldiers.

Of all the Navy and Marine men wounded up to the first of April, only 22½ per cent died; 53 per cent returned to active duty.

This record is due to the best medical care and equipment ever supplied an army, declares the official OWI report.

A first-aid packet strapped to the soldier's belt is the first treatment available. If the wounded soldier is conscious he begins to take sulfa tablets as soon as he is hurt, and dusts sulfa powder into the wound. If he is unconscious, his comrades may give him this first wound treatment.

Soon a Hospital Corpsman with a larger kit of supplies comes along and quickly ministers to the wounded man. An injection stops pain almost instantly. To his belt he ties a tag, telling what treatment was given, marks the spot for the litter-bearers, and goes on.

Litter-bearers take him to the battalion aid station, which can be compared to the emergency room of an ordinary hospital.

If severely wounded, he will eventually reach the great general or base hospitals. Some cases are flown all the way back to the United States.

Flexibility is what makes the system successful; mobility is the keynote.

One of the newest mobile units is the traveling optical laboratory. When a soldier who wears glasses has them broken, an optician is right at hand. The soldier is back on duty in a few hours.

The mobile bacteriological laboratory is a miniature Health Department on wheels. Laboratory tests show whether water is fit to drink, reveal the nature of any disease which breaks out, and checks the purity of food products.

There are also mobile x-ray machines—the best in the world. Composed of compact sections easily taken apart, an outfit can be fitted into three small trunks.

Extensive research is developing new Army and Navy medical equipment. Folding litters and folding arm and leg splints have been invented. A jungle kit contains apparatus for treating snakebite, various kinds of drugs from aspirin to atabrine, salt tablets to prevent heat cramps and an insect repellent.

The kit developed for our Arctic fighters contains material for preventing and curing frostbite, and multi-vitamins to help maintain fighting strength even on limited rations.—*Science News Letter,* May 29, 1943.

UNSAFE JOBS FOR YOUTHS

When boys and girls sixteen or seventeen years old go to work in a war factory, there are certain jobs that are safe for them and others which are too dangerous. Grown-ups, for example, can, unless they are unusually susceptible, work in an atmosphere in which there are 1.5 milligrams of lead in every 10 cubic meters of air. Such an atmosphere is not safe for boys and girls, in the opinion of the U. S. Children's Bureau.

No workers under eighteen years of age, the Children's Bureau advises, should be employed at the following types of work:

1. Work in connection with the production of white lead or other salts or oxides of lead.
2. Work in workrooms in which lead salts or oxides are used in such a state that they give rise to lead dust in the air.
3. Work in occupations in which metallic lead is regularly used in the molten state.
4. Work in connection with tetraethyl lead.

Types of work suitable for young workers, provided the work is done in rooms segregated from those in which lead compounds are used in the dry state and are essentially free from lead in the atmosphere, are:

1. Can filling and labeling in paint factories.
2. Marking and testing of storage battery cases.
3. Shipping-department work.
4. Machine-shop, woodworking, and other shopwork not covered by existing regulations.
5. Laboratory work.
6. Office work.

Further details about safe and unsafe work for young workers appear in a series of advisory standards being issued by the Children's Bureau, U. S. Department of Labor.—*Science News Letter,* May 15, 1943.

Minnesota Academy of Medicine

Meeting of March 10, 1943

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club, on Wednesday evening, March 10, 1943. The meeeting was called to order at 8:15 o'clock (following dinner) by the Vice President, Dr. Walter Camp, in the absence of Dr. L. B. Zimmermann.

There were forty-two members and two guests present.

Minutes of the February meeting were read and approved.

Dr. Wangensteen introduced Dr. Alfred Blalock, of Johns Hopkins Medical School, who gave a short talk and expressed his pleasure at being here and meeting various members of the Academy.

The Secretary read a letter from Dr. Oscar Owre, who stated that he is taking a leave of absence from active practice for an indefinite period. Due to this fact his name had been proposed as applying for admission to the Senior Membership group, and a motion was seconded and carried that this be done.

The Secretary read a letter from the House Committee Chairman of the Town and Country Club to the effect that due to rationing and their inability to obtain sufficient food supplies, they would no longer be able to serve dinners for large gatherings like the Academy. After some discussion it was decided to have a committee investigate the possibilities of other club facilities or changing the menus at the Club and continue the meetings, the Academy members to abide by the decisions of the committee.

The scientific program followed.

LARYNGEAL PALSY

Some Remarks on Paralysis of the Inferior Laryngeal Nerve, with Case Reports

KENNETH PHELPS, M.D.
Minneapolis, Minnesota

Voice production by the vocal cords has long been of interest to the medical men and to the educator (speech teacher, singing teacher). Recently a new group, the radio, movie, phonograph and telephone men, who are also interested in voice reproduction and amplification, have carried on many studies of the speech mechanism taking advantage of the equipment available in their fields: microphones, amplifiers, oscillographs, acoustic filters, sound films and phonograph records. Color motion pictures of the vocal cords in action, with sound effects, have been made, one of the most remarkable of which was produced by the American Telephone and Telegraph Company. The vocal cords can be viewed directly, by reflection, stereoscopically, with a stroboscope and periscope, and x-ray including tomography will demonstrate the vocal cords. Some instruments allow many observers to view the vocal cords simultaneously.

All of this activity has impressed upon us how little we know about the vocal cords and their very complex action. By means of moving pictures it was learned that the high tones are produced by a vibration of a small portion of each vocal cord and soon it was found that the thyroarytenoideus muscle has six fasciculi, with fibers of different origin, insertion, and actions, which explains how a varying extent of the vocal cords can be put under tension.

The peripheral nerve supply to the vocal cords consists of the superior and inferior laryngeal nerves, right and left. All of the vocal, respiratory, and valvular movements of the vocal cords, as well as their sensation, has to be controlled by these nerves, which are branches from the vagus. Some facts about these two nerves seem well established.

1. The superior has two branches, the sensory to the larynx and the motor nerve to the cricothyroid muscle.

2. The inferior is a motor nerve and originates as the accessory part of the spinal accessory nerve.

It is thought that the accessory nerve and the inferior laryngeal nerve are practically the same. There still is no general agreement as to whether the superior nerve supplies the interarytenoid muscles as a motor nerve or not. Nordland found it to be the exclusive supply in some cases while in others both the superior and inferior laryngeal go to this muscle.

For many years the laryngologist has attempted to diagnose the type of recurrent nerve paralysis by the position of the vocal cords. Mid-line position was thought to be a paralysis of the abductor fibers only. The adductors being active and unopposed, held the cord in the mid-line. Conversely the position of wide separation was called adductor paralysis. The cadaveric position (midway between the wide separation and approximation) was due to complete paralysis. The abductor fibers were said to be more vulnerable and in progressive disease abductor paralysis (mid-line position of the cords) always occurred first and later when the paralysis became complete the cord would move laterally to the cadaveric position.

Many cases of surgical injury to the recurrent nerve have been observed with sudden, complete paralysis of the vocal cord resulting. The nerve has been examined microscopically in numerous cases at postmortem and positive proof obtained that there was a *complete* loss of function. In these cases, the position of the vocal cord may at first be cadaveric but in nearly every case the permanent end result is the mid-line posi-

tion. This upsets the theory of abductor paralysis being the proper diagnosis.

The explanation of the mid-line position of the cord, in total paralysis of the recurrent nerve, may be that the superior laryngeal has some adductor function. Working on that theory, it would seem that if the superior nerve were also paralyzed there could be no adductor function and the vocal cords would no longer remain in the mid-line position. I saw a patient with one vocal cord in the mid-line position. Dr. Martin Nordland cut the superior laryngeal nerve on the same side and we were disappointed in seeing no change in the mid-line position of the cord. This patient was in Glen Lake Sanatorium and he was observed for many months.

Perhaps the best explanation for the mid-line position of the cord in total paralysis of the inferior laryngeal nerve is that accepted by the orthopedist following total paralysis of motor nerves. The muscle is flacid, then atrophic, becoming fibrotic eventually resulting in contraction. This series of events occuring in the musculature of the vocal cord would explain its being pulled into the mid-line position. The muscle transplant operation of King is based on this reasoning and seems to be the best form of treatment for the bilateral mid-line paralysis (not abductor paralysis). I have seen five cases of mid-line bilateral paralysis, but all have been unwilling to have the King operation, preferring to wear a tracheotomy tube continuously.

Case Reports

1. Case of neuritis of the recurrent laryngeal nerve following exposure to cold (like Bell's Palsy). Complete paralysis of one vocal cord with complete spontaneous recovery.
2. Case of complete paralysis of one vocal cord. A pharyngeal diverticulum was found on the same side. No operation for the diverticulum has been done as yet.
3. Case of complete paralysis of one cord coming on immediately following the first stage of an operation for pharyngeal diverticulum. The voice improved following the second stage, but the vocal cord is still totally paralyzed. Lahy warns of the danger of injury to the nerve as the base of the sac is stripped free of the muscle fibers of the inferior constrictor.
4. Case of thryroiditis—with pus found in the thyroid. Vocal cord paralysis developed and a carcinoma of the esophagus was found which had invaded the thyroid.
5. Case of thyroiditis with paralysis of the vocal cord developing and marked stridor. X-ray of the lungs showed multiple metastic carcinoma.
6. Old case of total mid-line paralysis of one vocal cord. The tomograph was interpreted as showing a tumor of the larynx invading the healthy vocal cord. Direct laryngoscopy showed no tumor but atrophy of the paralyzed cord with hypertrophy of the opposite side.

Conclusions

1. The mid-line position of the vocal cords results from total paralysis of the recurrent laryngeal nerve and is not a partial paralysis and should not be called "abductor paralysis."
2. A complete loss of function may return, as seen by laryngoscopy. However, an improvement in the voice does not mean a recovery from the paralysis. That may be due to the mid-line position of the paralyzed cord plus a compensatory action of the healthy vocal cord.
3. Pharyngeal diverticulum or the surgical treatment of it may produce recurrent nerve paralysis.
4. Patients treated for thyroiditis and developing a vocal cord paralysis should be investigated for cancer of the thyroid.
5. Too definite diagnoses should not be made by the laminogram. Direct laryngoscopy should be done to confirm such diagnosis.

Discussion

DR. ARNOLD SCHWYZER, Saint Paul: I think this is an excellent talk. That we may have paralysis of the recurrent laryngeal nerve in operating on a diverticulum of the esophagus was something that had not occurred to me, but it is important to know this. That we may have paralysis in thyroiditis is important too, especially if the posterior part of the thyroid is the seat of the trouble. I remember a young woman who had very high fever (105°), chills, sore throat, was delirious, and had just a little bit of pain on the left side of the neck. I made a diagnosis that she probably had thyroiditis or a small abscess on the posterior side of the gland. This brings it in direct contact with the recurrent laryngeal nerve. These cases, unless recognized early, are liable to make very serious trouble, as the infection can travel downward into the mediastinum.

For the surgeon, paralysis of the vocal cord is something so mean that a laryngoscopic examination should be made before operation. If on one side there is a preoperative paralysis we have to be very careful when we come to the area of the recurrent laryngeal on the other side. I can't agree with Dr. Lahey who makes it a rule to lay the recurrent bare routinely and then to follow it up so as to avoid it. I think we are very liable to damage it unless we have the dexterity of a Lahey. One other point I read of recently. In handling the upper horn of a bulky goiter, if you pull hard, you are liable to get paralysis of the external branch of the superior laryngeal nerve which runs in the connective tissues close to the upper horn. If one has a bulky goiter, one is liable to overstretch this nerve and get a paralysis of the anterior cricothyroid muscles. The thyroid hinges on the cricoid and is pulled forward by these muscles. They are thus tensors of the cords. Young patients may get over this but the older they are the more trouble they may have. The tension of the cords is greatly reduced and the voice becomes deep and even aphonic in a severe injury. This can happen just through forcible pulling on the upper horn of the goiter and a consequent overstretching of the nerve. The recurrent laryngeal, of course, is till more endangered in thyroidectomy than the superior laryngeal nerve. Apart from the cutting, there are cases (though I have not seen one) where apparently the pulling on the gland is liable to pull just enough so that only the fibers which run straight back to the crico-arytenoid muscles are affected and we get what is called a posticus paralysis. It appears in these cases that there is not a complete laryngeal paralysis but just the direct fibers which run straight back to the crico-arytenoid muscles are affected.

When you have a severe dyspnea following paralysis, as the Doctor mentioned, a tracheotomy, of course, is the simplest and, under ordinary conditions, the best. I remember one patient who had a terrific stricture of the larynx due to a luetic condition where we used another procedure. Instead of making a tracheotomy

which would have had to be permanent, I slit the thyroid cartilage, not in a straight up and down manner, however, but making the incision in a curved way so as to cause some protruding points which could be sewed together with linen so that there was a gap formed betwen the cords permanently, but the wound is closed and the larynx remained open.

Cutting the recurrent laryngeal nerve at times occurs in surgery of the thyroid and is very unfortunate. One such case I remember. I saw the patient about a year and a half after the operation. The neck had a very neat scar. The thyroidectomy was nearly complete. I operated on this patient about four or five years before Lahey published his first paper on repair of the recurrent laryngeal nerve. I used an ordinary parlor magnifying glass, which was sterilized. The recurrent laryngeal nerve was looked for first low down in the neck in the groove between trachea and esophagus. From there I followed it up and found it cut about half an inch below the upper border of the cricoid. Then we found a short stump which was left of the upper portion near its disappearance into the depth. You may remember that the thyroid cartilage hinges on the surface of the cricoid by short lateral articular prominences. Just behind this articulation the nerve dips into the interior of the larynx. Stretching the nerve very gently and starting low down in the neck, gradually working upward, the two ends could be united with a little black silk. The result was so surprising that I knew at once we had to deal with some fraud. After about three days that woman—very neurotic—could talk so loudly that I could understand her well from a distance of 50 or 60 feet. The patient had been absolutely aphonic before operation—or rather made others think so—because she had it in for the other surgeon. I told her what I thought of the case, which made her furious. Thus, I missed a chance to find out if the vocal cord had improved. Later she sang in a church choir. I feel sure, now, she had been completely aphonic because she wanted to be. Perhaps she could have sung without my operation.

CHRONIC OR RECURRENT BRUCELLOSIS

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Abstract

Brucellosis in Minnesota is most commonly due to brucella abortus or suis, but it must be remembered that the melitensis or goat-type may occur. Differentiation of the three strains is extremely difficult even in the best equipped bacteriological laboratory. In Minnesota only eight cases of brucellosis were reported in 1927; ninety-three in 1939, (188 in Iowa, 372 in Oklahoma). In 1942, 268 cases were reported to the Board of Health in Minnesota, but 7,440 blood specimens were sent in for agglutination tests. Only 477 gave a typical positive test in a dilution of 1:80 or above. Of 398 blood cultures only 29 or 7.2 per cent were positive.

The conclusion that a great many acute and chronic cases remain undiagnosed, is inevitable. The disease may attack any part of the human body. Chronic spondylitis may be due to brucella infection, but its suggested relationship to rheumatoid arthritis and coronary heart disease, appears to be without foundation. Chronic brucellosis may follow severe, acute infection (less than 10 per cent), or start insidiously with obscure and comparatively mild symptoms, such as malaise, weakness, loss of weight, some fever, andorexia, headaches, mental depression and excessive perspiration. Frequently it is diagnosed, without doubt, as an influenza infection. An absolute diagnosis can be made on the basis of positive blood cultures only. However, they are too frequently negative in both acute and chronic cases to be of value as a routine measure in general practice. Agglutination tests are more often positive, but must be carefully evaluated when occurring in a dilution of 1:80 or less. Severe acute cases may never develop a positive agglutination titer and again a high agglutination titer developed during an acute attack may persist for many years without actual active infection. The intradermal skin test has exactly the same significance as the Mantoux test for tuberculosis. No matter how strongly positive it reacts, it does not mean active disease. Further studies on the value of the intradermal test in the diagnosis and its relationship to the production of opsinins and agglutinins are needed before this most sensitive test can be recommended as a routine procedure, or eliminated as too sensitive and confusing.

Examination of the blood in acute cases most frequently shows a normal or only slightly elevated leukocyte count; in a few instances relative lymphocytosis. In chronic cases normal values are most common. The sedimentation rate was normal in all cases examined; therefore, of considerable help in the differential diagnosis from other infections.

The sulfonamides are of no value in chronic brucellosis. Vaccine therapy has given satisfactory clinical results in most instances. Four typical cases of chronic brucellosis were reported in detail.

Discussion

DR. ERLING W. HANSEN, Minneapolis: I think it hardly fair to Dr. Schaaf to leave out the urologist, the otolaryngologist and the psychiatrist when he brought up this subject. I have been interested in this from the standpoint of eye, ear, nose and throat chiefly because of two cases, one being one of our younger medical men who was practicing in the country. He was brought down for operation on the frontal sinus. After studying him in the hospital, it was discovered he had brucellosis. It wasn't so very long after, that a man came from that same territory with a note from the doctor for our best attention. He came for a mastoid operation because of severe pain he had over the region of the right mastoid. Neither one of these, from last reports, had any encephalitis so far as could be determined. The young physician later had a Fellowship in surgery and has now been accepted in the Navy so apparently there is no aftermath. In Huddleston's interesting book on brucellosis, he has a chapter on the various parts of the body. I found that headaches which simulate almost any condition in the head are very frequent. That is true also of everything else that Dr. Schaaf has said. There may be symptoms that simulate many other conditions. There is no question but what there is a good deal of brucellosis in Minnesota, as well as in Iowa, Michigan, and California where most of the reports come from. I think Dr. Schaaf's paper will help to call attention to it here. It is a very important subject and I believe Dr. Schaaf should be commended for bringing it to our attention.

DR. A. STEWART, Saint Paul: I want to ask Dr. Schaaf if children recover quicker than adults. I have

one child now who after about four weeks is apparently normal.

DR. SCHAAF: Yes, children seem to have a greater natural resistance than adults. As a matter of fact, severe, fulminating infections are quite rare in children; mild infections are probably quite common. They are usually called grippe. The differential diagnosis is not easy, but perhaps less difficult in the acute cases, because in this part of the country we have very little typhoid to deal with, and we see only an occasional case of malaria. The differential diagnosis from miliary tuberculosis or subacute bacterial endocarditis, may keep one in suspense for several weeks. I have seen quite a few patients with brucellosis the past few years, and feel that we should endeavor to make the general practitioner more conscious of the fact that this disease exists in great numbers in the rural districts. However, we must realize that there is a great need for further development and careful checking of our diagnostic tests. Of the two young men Dr. Hansen mentioned, one of them had an extremely severe case due to a milk-borne infection. He had several recurrences, but is apparently well today. The bovine and porcine types do not produce the undulant fever curves reported in the infections due to the goat strain. Eye symptoms are not infrequent. Headaches may simulate sinus or mastoid disease. Any part of the human anatomy may be involved in the clinical picture.

DR. C. B. DRAKE: Can it be contracted by milking?

DR. SCHAAF: Yes, it can be through the skin and gastro-intestinal tract.

DR. J. M. ARMSTRONG, Saint Paul: Is it the same thing as milk sickness?

DR. SCHAAF: I am quite sure it is the same thing; in fact, the original description of brucellosis goes way back to Hippocrates.

The meeting adjourned.

E. V. KENEFICK, M.D.
Secretary

REPORTS and ANNOUNCEMENTS

IMPORTANT ANNOUNCEMENT

The Centaur Company, makers of Fletcher's Castoria, inserted a warning in every newspaper in the country on May 5, 1943 to the effect that all Fletcher's Castoria shipped since March 1, 1943 contains a foreign ingredient, which causes nausea and vomiting. Inasmuch as neither retailers nor consumers can distinguish between packages containing the product manufactured before March 1 and after that date, the product has been withdrawn from the market and retailers have been asked to return all stocks on hand.

HENNEPIN COUNTY MEDICAL SOCIETY

Election of Dr. Thomas J. Kinsella as new president of Hennepin County Medical Society was announced Monday night, May 3, 1943, at a "recognition meeting" held in the Society rooms in the Medical Arts Building, Minneapolis, honoring its one hundred thirty-seven members now in military service.

Other new officers announced were: Dr. James K. Anderson and Dr. A. E. Cardle, vice presidents, Dr. D. A. MacDonald and C. A. McKinlay, directors; Drs. F. G. Benn and Julius Johnson, members of board of censors; Drs. S. R. Maxeiner and O. W. Yoerg, members of board of ethics, and Drs. James A. Johnson and T. W. Weum, trustees.

Drs. W. H. Aurand, A. E. Benjamin, Frank R. Hirschfield and Theodore H. Sweetser were named delegates to the Minnesota State Medical Association.

Tribute to physicians and surgeons in the armed services and to their families was paid by Col. William G. Guthrie, Fort Snelling, who explained work of military hospitals.

"I can speak highly of Minnesota doctors and men in service from first-hand experience with them," said Colonel Guthrie, "because I was surgeon of the Fifth Army Corps at Camp Claiborne, La., when the 34th Infantry division, composed largely of men from Minnesota, was trained there."

The Rev. David Nelson Beach also spoke, and a stand of colors, gift of the Woman's Auxiliary to the Society, was presented by Mrs. Joseph M. Hall, Auxiliary vice president.

Newly elected candidates will take office in October..

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The May meeting of the Minnesota Society of Neurology and Psychiatry was held at Rochester, Minnesota, Saturday, May 29, 1943. Dr. A. W. Adson was in charge of the program which included the following surgical clinic, presentations, and scientific cinema: Surgical Clinic—Demonstration of Prefrontal Lobotomy, Dr. J. G. Love and Dr. A. Uihlein; Prefrontal Lobotomy—Dr. M. C. Petersen; Sleep Paralysis—Dr. J. G. Rushton; The Anatomic Basis of Cerebellar Symptoms—Dr. J. R. Brown; Scientific Cinema—Myasthenia Gravis—Dr. L. M. Eaton.

Luncheon was served at the Mayo Foundation House. The guest speaker was Mr. Geoffrey Jefferson, dean of British neurosurgeons, who told of his war experiences.

WASHINGTON COUNTY

The regular meeting of the Washington County Medical Society was held May 11 at the Stillwater Club rooms.

The attendance was unusually good, due to the interesting program. A colored talking motion picture on "Ulcers of the Stomach," a film on "Right Ileocolostomy for Cancer" were presented, and Dr. Edward Schons completed his lecture on "X-ray Therapy."

Dr. Joel Theodore Holcombe was elected a member.

A case of tuberculosis was reported among the school children in Marine-on-St. Croix. The patient had intimately exposed the other pupils in the school bus and also pupils in the school. Dr. E. A. Meyerding has requested that the school children be given the Mantoux test, that the positive reactors be x-rayed, and that all contacts be investigated.

Minneapolis Surgical Society

Meeting of October 1, 1942

President, Richard R. Cranmer, M.D., in the Chair
Secretary, R. F. McGandy, M.D.

HYPERPARATHYROIDISM—CASE REPORT

CARL O. RICE, M.D.

UNUSUAL LESIONS OF THE NECK

MARTIN NORDLAND, M.D.

BULLET WOUND INVOLVING THE TRACHEA, ESOPHAGUS AND PLEURA

THOMAS KINSELLA, M.D.

SOME PROBLEMS IN THE PRE-OPERATIVE AND POSTOPERATIVE CARE OF PATIENTS WITH HYPERTHYROIDISM

Experience in the Treatment of Goiter at the University of Minnesota Hospitals

CHARLES E. REA, M.D.
Saint Paul, Minnesota

There are few diseases in which careful pre- and postoperative care are so necessary as in hyperthyroidism. The importance of mental and physical rest through controlled environment and drugs, high caloric intake, and the judicious use of iodine therapy in the form of Lugol's solution is well recognized. The surgeon's care and skill at operation and attention to the postoperative care means the difference between a smooth and a stormy convalescence.

In spite of excellent care, there are some patients with hyperthyroidism who do not respond well to preoperative therapy. In spite of varying the amount of rest, diet, sedation, Lugol's solution or thiamine chloride, these patients may have a persistently high basal metabolic rate or pulse; their weight is stationary, and, try as they may, they never attain a physical or mental calmness.

Of all the components of preoperative treatment of patients with severe hyperthyroidism, there is none so abused as the use of Lugol solution. When iodine first came into general use in the early '20's, the answer to the goiter problem was thought to be found. However, this has proven not to be the case in the ensuing years. Empirically, one gives five to ten drops of Lugol's solution three times daily to patients with hyperthyroidism. One should never give Lugol's solution for more than two-week periods without evaluating the clinical status of the patient. The practice of giving Lugol's solution for months to goiter patients is to be condemned, as it is not only unnecessary but also it may confuse the clinical picture.

Patients whose clinical condition does not improve in spite of Lugol's solution (iodine fast) are often improved by attention to rest, diet, sedation, or thiamine chloride. In six iodine-fast patients with goiter the use of diiodotyrosine gave no more benefit than that obtained with Lugol's solution.

The practice of treating children or adults with mild hyperthyroidism with small doses of iodine over a long period of time has been advocated by some clinicians. In our opinion this is a dangerous form of therapy for the reasons mentioned above, and it puts a big responsibility on the physician prescribing the treatment. Thyroidectomy is a safer and surer method of treatment. It is our policy to be more conservative with children developing mild degrees of hyperthyroidism about the time of puberty. Two instances of mild exophthalmic goiter in children have come to our attention, in which spontaneous remission of symptoms after puberty occurred. Older children with hyperthyroidism have been subjected to thyroidectomy similar to that in adults.

At this clinic Lugol's solution is given to patients with hyperplastic goiters and also to those with nodular goiters with hyperthyroidism, both pre- and postoperatively. In our experience it is not necessary to give iodine medication patients with nodular goiter without hyperthyroidism, either before or after operation. Rather disturbing, however, is the fact that of 155 patients with "nontoxic adenoma of the thyroid," operated upon at the University of Minnesota Hospitals between the years of 1933 and 1940, who had not received Lugol's preoperatively, three showed degrees of thyroid storm postoperatively. These were probably cases of latent hyperthyroidism, not diagnosed clinically. For this reason, it is the author's personal opinion that it does no harm to give the majority of patients with nontoxic adenomata of the thyroid Lugol's solution before operation. The question of what percentage of nodular goiters without hyperthyroidism will be made toxic by the use of iodine is important (so-called Jodbasedow). It is said that in Kocher's clinic the use of iodine for sterilizing the skin in goiter operations was forbidden. Kocher's successor, deQuervain, listed thirty-three cases of Jodbasedow in nine years. However, Dr. Carl Rice, at the goiter clinic at the University of Minnesota Hospitals, has purposely treated cases of nodular goiter without hyperthyroidism with low doses of Lugol's solution (one to two drops a day) up to a period of two years, and has not seen a case that was made toxic by the iodine medication. Further, there are no statistical studies to show that there are more cases of toxic goiter developing among persons who took iodine for nodular goiter than among goiterous persons who did not take iodine (McClenden). It is the author's opinion that some instances of Jodbasedow are really cases of latent hyperthyroidism, flared up by stimuli other than the iodine. The

whole question of Jodbasedow merits a complete and critical re-investigation before definite conclusions are warranted, however.

Some patients with persistently toxic goiter have been treated by means of deep x-ray therapy. There is no question but that selected cases of hyperplastic goiter can be successfully treated by this method alone. It is this author's opinion, however, that it is best used only as a temporary method until the patient's condition permits surgical removal of the gland. There are some objections to the use of irradiation therapy in cases of hyperplastic goiter.

1. As compared to surgical removal, radiation therapy takes a longer time to produce beneficial results.
2. Thyroid crisis may develop in patients with hyperplastic goiter during a course of deep x-ray therapy.
3. It is of little value in the treatment of toxic nodular goiter.
4. In comparable cases, the end results of irradiation therapy do not equal those obtained with surgery.

In patients with severe hyperthyroidism, one may fear to do even stage operations to remove the goiter. In 1935, the procedure, suggested by Miles Porter, of injecting boiling water into the thyroid gland in order to destroy its substance was carried out upon eight patients. Our impression is that it is at best a good form of psychotherapy. For one thing, it is questionable whether "boiling" water is actually injected into the thyroid gland. While the water may be so hot that the surgeon can hardly hold the syringe in his hands with cotton gloves, one can touch the needle through which the water is injected without undue discomfort. Also, except for some areas of hemorrhage, the microscopic studies of the thyroid gland subsequently removed did not show marked fibrosis or parenchymal destruction. The procedure has some merit in that it accustoms the patient to the operating room.

Ligation of the superior thyroid vessels is often suggested as a preliminary treatment of severe thyrotoxic patients. It is becoming less and less popular as a form of therapy at this clinic; in fact, it has not been performed as a stage procedure here in the last two years. In the opinion of this author, there are several unsatisfactory aspects of polar ligation:

1. In order to carry out a ligation of the superior thyroid artery properly, the vessels should be ligated where they come off the external carotid artery. It is the author's opinion that too often just branches of the superior thyroid vessels are ligated.
2. It often takes more time and is more of a strain on the patient than the surgeon realizes. There is at least one instance of thyroid storm following polar ligation at this clinic.
3. Reference to the records available in six polar ligations done at this hospital within the last seven years shows that the results are questionable as far as improvement in the blood pressure, pulse and general condition of the patient is concerned.

The following factors should be taken into consideration before operating on the thyroid gland: the patient's age, the size of the gland, the response to Lugol's solution, the duration of the hyperthyroidism, the basal metabolism rate, the pulse, the gain in weight and the patient's general physical and mental condition. The procedure to be used should be decided in the surgeon's mind in the patient's room *before* operation and not at the operating table. If, from an evaluation of the patient's condition, just a ligation of the superior poles of the thyroid gland or a lobectomy is agreed upon, it is inviting disaster to proceed further just because the patient stood the stage procedure well. Moreover, if the patient begins to react badly while the surgeon is doing the procedure contemplated before operation, it is best to do the minimum and, if the operation has not gone too far, to close the wound as quickly as possible. The three fatalities that have occurred in this clinic during the past two years in thyroid patients (out of a total of 286 operations) have been due to failure to observe one or both of these two rules.

Since the whole rationale of thyroidectomy in hyperthyroidism is to shift the patient from a state of hyperthyroidism to one of hypothyroidism, hoping to hit a happy medium, one can realize how much the experience of the surgeon counts in judging how much of a thyroid should be removed. In severe thyrotoxic patients, one aims to do a bilateral subtotal thyroidectomy in one or more stages. It is interesting to note how the stage procedure has passed from one of necessity to one of election. At this clinic, a unilateral lobectomy is the stage procedure of choice in the severe thyrotoxic patient. A right subtotal lobectomy is usually performed first, with surgical removal of the left side being deferred until two to four weeks later. The use of local, general inhalation or intravenous anesthesia, or combinations of these, depends somewhat on the choice and temperament of the surgeon. Ether is a bad anesthetic for thyrotoxic patients, as it tends to produce pulmonary edema. Cyclopropane has been used as the chief inhalation anesthetic at this clinic, but is contraindicated if the patient has cardiac irregularity. Its chief value lies in the high oxygen content of the mixture.

At the University Hospitals the use of intravenous pentothal ("Sneak thyroidectomy") has proven of value in patients with toxic goiter. The procedure is as follows: For two or three days before operation the patient is given 1000 c.c. of 5 per cent glucose in saline intravenously. Since operations are performed in the afternoon at this hospital, the patient is given a liquid breakfast on the day of operation and intravenous glucose solution. No other preparation is made, so that the patient is unaware that he is to be operated upon that day. Just before operation, when the infusion has just about been completed, intravenous pentothal is given through the same infusion needle. The sleeping patient is taken to the operating room where the neck is prepared for operation and inhalation anesthesia is initiated. Even though intravenous pentothal and inhalation anesthesia have been used, some patients with severe hyperthyroidism have had degrees of thyroid storm postoperatively. To prevent such an occurrence, spinal anesthesia in the operative management of severe hyperthyroidism has been used. This

idea was suggested from the good result following the use of a spinal anesthetic in a case of thyroid crisis. The case report of the patient with thyroid crisis treated with spinal anesthesia is as follows:

The patient was a white, married woman, forty years old, who had had symptoms of hyperthyroidism for eight months. She had lost thirty-five pounds in weight in that time, was nervous, irritable, and had noticed a slight exophthalmos. Her appetite was excessive and her palms were always moist with perspiration.

Examination of the thyroid revealed a diffusely enlarged gland. There was slight exophthalmos. Her blood pressure was 140/180. Three basal metabolic rates had been plus 53, plus 32 and plus 20 per cent, while receiving Lugol's solution and sedation for one month. The pulse dropped from 120 to 90 during this time. Examination of the urine was negative. The hemoglobin was 65 per cent with 3,500,000 erythrocytes.

On May 13, 1941, a bilateral subtotal lobectomy was performed. The patient seemed to stand the procedure well, but that evening the pulse rose to 140 per minute, the blood pressure 170/90, respiration 32 per minute and temperature 103.6 (rectal). She was restless and somewhat confused mentally. In the ten-hour period since operation she had been given 2500 c.c. of 5 per cent glucose in normal saline, two doses of morphine sulfate, gr. ¼, two doses of nembutal, gr. III, 15 gr. of sodium iodide intravenously, 60 minims of Lugol's solution in 200 c.c. of tap water by proctoclysis.

When the author saw her in consultation about twelve hours after her operation, there was no question but that she had a thyroid crisis. The attending surgeon had tried everything that is usually given for this condition. It was decided to try to increase the sedation and also to give a blood transfusion. The next morning the patient was very restless and irrational. The nurse said that nembutal, gr. III every two hours for three doses, failed to quiet her. The patient's temperature was 104.6 (rectal), pulse 160 per minute, blood pressure 180/110, respiration 45 per minute and the patient looked as if she were going to die unless some relief were given shortly. It was then decided to try spinal anesthesia. Sixty milligrams of procaine hydrochloride (novocaine crystals) were given intraspinally in the third lumbar space. Anesthesia was obtained to about the fourth rib anteriorily, but it was not complete, as the patient could still move her legs after the anesthesia was given. The effect on the blood pressure, pulse, respiration and temperature was dramatic. The blood pressure fell almost immediately (shock-like phenomena?), the pulse and respiration became slower, and the temperature was 100° about three hours later. The patient immediately became quieter and went to sleep. This was somewhat disturbing at first, but since the blood pressure was maintained above shock level, no great concern was felt. The anesthesia wore off in about one and a half hours. Following this the patient was given phenobarbital, gr. I, t.i.d., and Lugol's solution gt. XV, t.i.d., and 3000 c.c. of 5 per cent glucose, half in saline and half in triple distilled water, every twenty-four hours for three days. Twenty-four hours after the anesthesia, the blood pressure and pulse rose temporarily, but this was apparently controlled by nembutal, gr. III. The patient made an uneventful recovery and was discharged on the fourteenth postoperative day. When seen six weeks later, she said she felt better, had gained ten pounds, less nervous and irritable. Her basal metabolism rate was plus 12 per cent, pulse 90 per minute.

A review of thyroid crisis is beyond the scope of this paper, but it will be mentioned here as it has bearing on what will be discussed later. The disturbing feature in the treatment of thyroid crisis or storm is that there is no specific therapy known to date. Fundamentally, the cause of this condition is still obscure. It is not certain whether the primary difficulty lies in the thyroid gland itself or whether other organs, such as the adrenal, liver, pituitary, etc., are the site of the disorder. If the primary organ at fault is the thyroid gland, it is unknown whether the symptoms are due to an excess of normal secretion or to an abnormal secretion. Crile seems to believe that the adrenals are at fault in thyroid crisis. Maddock, Coller and Pederson have found "adrenalin" in the peripheral venous blood of some patients with reactions to hyperthyroidism, the quantities found suggesting a direct relationship to the severity of the reaction. Lahey states that in his opinion "most thyroid deaths are largely liver deaths." The results of the thorough review by Foss, Hunt and McMillan showed that neither the heart, liver, thyroid nor thymus alone seemed to be at fault in thyroid crisis. In their opinion there was no proof that thyroid crisis followed sudden hypersecretion of thyroxine, epinephrine or both. Good summaries of the present concepts of thyroid crises are given by Foss, Hunt and McMillan and also by Pemberton. One reason why postoperative crisis, in association with typical exophthalmic goiter is now uncommon, is that these patients are given careful postoperative care.

Postoperatively, it is important to watch the blood pressure, pulse, respiration and temperature, because if they begin to rise, one should suspect a thyroid storm or crisis. When a thyroid crisis begins or seems imminent, the therapy consists of the judicious administration of sedation; iodine medication by vein, mouth or rectum; oxygen therapy, intravenous glucose and fluid; cold compresses, etc. Occasionally blood transfusions have been given. It would be interesting to see what effect transfusions of blood from patients with myxedema would have on patients with a thyroid storm.

Occasionally, however, in spite of the above measures, the patient does not improve. In such instances, the use of spinal anesthesia might be considered. Crile has reported beneficial results following spinal anesthesia in a few cases of thyroid crisis. Bartels, Stuart and Johnson tried it in one case. While the immediate clinical improvement was striking, the patient subsequently died. The procedure is not irrational, on the basis that spinal anesthesia temporarily denervates the adrenal glands.

To date, spinal anesthetic has been used in three cases of thyroid crisis with good result at this clinic.

Because of the good results following the use of spinal anesthesia in cases of thyroid crises, it was suggested that spinal anesthesia might be used as a preoperative measure in cases of severe hyperthyroidism. The first case so treated is given in detail because when operation was first attempted, without the spinal anesthetic (control), the patient had a severe reaction on the table.

C. G., aged forty-one years, was admitted to the University of Minnesota Hospitals on October 11, 1941. He gave a history of dyspnea, and fatiguability since

the winter of 1940-41. Rather marked irritability had been noted by his wife about eight months previously. He noticed a mass in his neck and pounding of the heart approximately three months prior to admission. In spite of an increased appetite, he had lost thirty-five pounds in the past year. He had noticed tremor of the hands for approximately two years.

On admission, the patient's temperature was 98.8, pulse 100, respiration 20, blood pressure 138/60.

Physical examination revealed a well-nourished, well-developed white male who was rather hyperactive. There was a mild exophthalmos of both eyes. The thyroid gland was diffusely enlarged and firm. No bruit was heard. The heart was of normal size and the tone was forceful. No murmurs were heard. The lungs were clear to auscultation and percussion. There were no abdominal masses. There was a fine tremor of both hands. There was a staring impression of the eyes and definite lid lag was present.

The patient had received Lugol's solution, ten drops three times a day, since September 28, 1941. He had also been given phenobarbital, gr. 1ss three times a day and thiamine chloride, one milligram four times a day. Some difficulty was experienced in raising his caloric intake sufficiently, but with a 5200 caloric, high carbohydrate, high protein diet, his hunger was relieved and he began to gain weight. His basal metabolic rate on September 18, 1941, was plus 84 per cent; on October 2, 1941, plus 74 per cent; and on October 12, 1941, plus 51 per cent. The basal metabolic rate never went below this level at any subsequent test. His pulse rate was not excessive and consequently it was thought that lobectomy should be attempted.

He was taken to the operating room on October 28, 1941. Pentothal was given intravenously in his room and he was taken asleep to the operating room, where inhalation cyclopropane anesthesia was instituted. At the beginning of the operation the blood pressure was 140/80 and the pulse 120 per minute. After making the skin incision in the neck, his blood pressure was 180/90, but the pulse was still 120 per minute. On cutting through the platysma muscle and retracting the strap muscles of the neck, the blood pressure was found to be 220/100 and the pulse 160. Some of this untoward reaction was thought to be due to the cyclopropane, so this anesthetic was discontinued and only oxygen given. However, as the patient did not improve, the skin incision was closed and the patient transferred back to his room.

Postoperatively the patient had quite a stormy time for the first few postoperative days. Because of this reaction, it was decided to give the patient a course of deep x-ray therapy to the thyroid gland; he received 500 r/air to the anterior thyroid region and 250 r/air to the right and left lateral thyroid areas over a period of nine days from November, 1941, to November 14, 1941. His basal metabolic rate on November 7, 1941, was plus 53 per cent. The patient became somewhat restless and did not seem to acquire a mental and physical calmness during this time. On November 17, 1941, the patient was taken to the operating room again. Anesthesia was induced with intravenous pentothal sodium in the patient's room. In the operating room, 75 mg. of procaine hydrochloride was given intraspinally in the third lumbar interspace. Anesthesia, as determined by pinching the skin with a Backhaus forceps was obtained to the third intercostal space. Inhalation ethylene anesthesia was then given and a bilateral subtotal thyroidectomy performed.

The patient had a surprisingly smooth operative course: The blood pressure was maintained at about 140/80 and the pulse between 100 and 120. Postoperatively, the patient's condition was good and, except for a hematoma in the wound, his course was uneventful. He was discharged on November 30, 1941, with instructions to report for checkup to the out-patient clinic. When seen on January 16, 1942, his basal metabolic rate was plus 35 per cent, his weight was 215 pounds, and he looked and felt well. On April 16, 1942, his basal metabolic rate was plus 12 per cent, his weight 220 pounds and he was doing moderately heavy work.

To date, we have operated upon twelve patients with severe hyperthyroidism using a combination of intravenous pentothal, spinal and inhalation anesthesia. Under this regimen we have been able to do bilateral subtotal thyroidectomy upon patients who heretofore we would have only done stage procedures. The basal metabolic rate in these patients before operation was never lower than 40 per cent. We have been impressed with the smooth operative and postoperative course in these cases.

The whole purpose of the spinal anesthesia as used in these cases is to inhibit medullary adrenal releases during the operation, which would forestall the occurrence of an immediate severe postoperative reaction. It is not the intent to secure anesthesia to a level (second to fourth cervical segment) which would permit the operation being done under this agency alone. The question comes up, of course, how do we know that the adrenals are so important in thyroid storm. We believe that the adrenals are important first because of the reactions accompanying the so-called Goetsch test. In this test, if adrenalin is given intravenously to patients with mild or latent hyperthyroidism the patient gets a reaction akin to a thyroid strom. Secondly, we have examined the blood sugar of these patients before, during, and after thyroidectomy and have found that the blood sugars are not elevated. If there were signs of hyperadrenalism, one would expect an increase in the blood sugar. Certainly, when spinal anesthesias have not been used upon the patients operated upon with either general anesthesia or pentothal, we have observed an increase in the blood sugar. As yet, we have made no determinations of the amount of adrenalin in the blood during these operations (Whitehorn test).

It is important that a somatic analgesia to about the fourth dorsal segment be derived from the use of spinal anesthesia, if one hopes to inhibit the splanchnic nerves to the adrenal glands. We have checked the anesthesia by noticing when the patient gives evidence of pain by pinching the skin of the chest at different levels. It is to be emphasized that it is not necessary to use a spinal anesthetic in all thyrotoxic cases. It is not the purpose of this paper to recommend the use of spinal anesthesia in the routine treatment of thyroid crisis. In fact, there are several objections that might be voiced against its use: (1) spinal anesthesia is not a harmless form of therapy in itself and its use in an ill patient is not without danger; (2) there is no definite proof that the adrenal glands are primarily at fault in thyroid crisis; (3) the post hoc ergo propter hoc type of reasoning is dangerous, especially when other medications are used; and (4) thyroid crisis may cure itself spontaneously.

On the other hand, the whole treatment of thyroid crisis is symptomatic and until a specific cause and

treatment for the condition is known, the therapy will be rather empirical. It would seem justified to use spinal anesthesia in selected cases when the usual methods of treatment of severe thyroid crisis have failed.

Certainly its use in the operative treatment of severe hyperthyroidism would seem justified and the risk seems less than it would be if one attempted to do the same operation without the spinal anesthetic. The patients must be carefully selected, however, and wholesale application of the method certainly is not warranted.

Summary

Some impressions concerning the treatment of goiters at the University of Minnesota Hospitals have been reviewed. A plea for a more rational use of Lugol's solution is made. In the patient with severe hyperthyroidism, who does not respond well to preoperative therapy, the use of deep x-ray or thyroidectomy in stages has been unsually carried out.

We have been impressed with the use of spinal anesthesia as an adjunct to the operative and postoperative management of severe hyperthyroidism. The basis of the proposal is predicated on the thesis that an effective spinal anesthesia, which would inhibit medullary adrenal releases during the operation, would help to forestall the occurrence of immediate severe postoperative reactions. It is not the intent to secure anesthesia to a level (second to fourth cervical segment) which would permit the operation being done under this agency alone. On the contrary, a somatic analgesia to about the fourth dorsal segment is derived with the use of spinal anesthesia, the analgesic for the performance of the operation upon the neck being obtained with the use of other agents—usually a combination of pentothal and cyclopropane. The idea is rational and feasible; further investigation is necessary to determine how valid the premises are.

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Discussion

DR. RALPH T. KNIGHT: Dr. Rea is to be greatly congratulated upon his willingness and courage to consider spinal anesthesia as a method of management for the acute situations in hyperthyroidism, especially with so little recorded experience to be found in the literature. The soundness of the theory led him to use it as a last resort in the cast of postoperative storm which he has related.

I was startled when he first came to me asking for spinal anesthesia for a case to be immediately operated. I wondered if he had come under the spell of a certain surgeon who has reported a good many thyroidectomies under high spinal anesthesia. His explanation and his description of the above case made me anxious to go along with him. Dr. Rea has described to you the first case that he operated under this management, namely, pentothal induction in bed, spinal anesthesia upon reaching the operating room, maintenance of general anesthesia with one of the gases. The patient came through the operation with no reaction. This was in contrast to a previous attempt when the operation was abandoned because the pulse and blood pressure had risen to such alarming heights by the time the incision was made.

As an example of the use of a spinal anesthesia in the treatment of thyroid crisis, I was especially impressed by the case of a sixteen-year-old girl who had had thyroidectomy for hyperthyroidism. After being home a few days she came into the hospital with a pulse rate of 160; blood pressure, systolic 180, diastolic 90; eyes, very alert and yet rather glassy; mien apprehensive. We gave her spinal anesthesia in bed as her only treatment. In twenty minutes her pulse began to slow down and her blood pressure to decline. In thirty-five minutes she was an entirely different girl with pulse rate 80, blood pressure 125 systolic, 75 diastolic; she was calm and natural, said she wanted to sleep and did so.

The anesthesia must be planned so as to reach the fifth dorsal segment in order to block the sympathetic nerve supply to the suprarenals. We have used only procaine in these cases. The dose has varied from 80 to 120 milligrams. I see no reason why the higher dose should not be used. The head of the table may be tilted downward 10 degrees for a few minutes to assure high enough anesthesia. In so doing the patient's head should be raised on a pillow to prevent the anesthesia from extending to the cervical segments.

In these cases we have not used any pressor drugs to prevent or treat falling pressure. Blood sugar estimates were made before, during and after the spinal anesthesia to help estimate the changes in suprarenal function and we did not want to cloud this picture. In two instances the blood pressure fell rather alarmingly during operation. This was treated by Trendelenburgh position and intravenous fluid and responded fairly satisfactorily.

I wish that the term "shock" would not be used to describe the fall of blood pressure under spinal anesthesia. The mechanism is entirely different from shock. In true shock capillaries are dilated and permeable but small vessels are in spasm. Vasoconstrictor drugs are contraindicated but fluids, serum and blood should be used in proper proportion. In spinal anesthesia small vessels are dilated rather than constricted and vasoconstrictor drugs can well be used to restore the normal condition.

I believe that after informative data have been gathered in regard to blood sugar and other evidences of changes in suprarenal function, it will be well to use careful doses of ephedrine or neosynephrin as indicated to keep the blood pressure under control while using spinal anesthesia in the emergency management of extremely hyperthyroid patients.

Dr. Rea has really opened up an extremely important field in therapeutics.

DR. C. E. MERKERT: I wish to ask about the possibilities of doing a paraspinal sympathetic block to cut off the adrenal stimulation in place of the spinal anesthesia in these severe goiter cases. Is pentothal better than avertin for inducing anesthesia in the thyroid patient?

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DR. KNIGHT: For this purpose it is necessary to block the sympathetics as high as the fifth thoracic segment. Thoracic sympathetic block is more difficult and carries more risk than lumbar sympathetic block. I believe for this purpose it is better and more simply accomplished by spinal, that is, subarachnoid anesthesia.

I personally prefer pentothal to avertin. The dose can be much more accurately administered with much less fuss and bother. In some places avertin is almost routinely used as preanesthetic medication.

DR. T. H. SWEETSER: What about the volume of spinal fluid and the drug used?

DR. KNIGHT: This question brings up the discussion of spinal anesthesia in general which I did not mean to enter. For these cases, we have used procaine exclusively. The dose has been up to 120 milligrams. Enough spinal fluid should be added to dilute the solution to 5 per cent or even 4 per cent. Stronger solutions should never be injected. Seven per cent results in a small but definite incidence of prolonged or permanent effect upon the nerve tissue. With still stronger solutions the incidence increases. Injection should be made at a rate not less than 1 c.c. per second so as to spread the solution immediately into the spinal fluid. Slower injection encourages the layering of the solution under the spinal fluid, thus subjecting nerve roots to too strong a solution.

For other purposes of spinal anesthesia we use almost all of the preparations available except spinocaine. We use nupercaine, pontacaine, metycaine and procaine, according to the characteristics of the drug. We use procaine and metycaine never stronger than 0.5 per cent; nupercaine never stronger than 1-1500. Any of them may be injected rapidly without harm but none should be injected slowly.

DR. REA (closing): In regard to Dr. Nordland's discussion, I am not exactly sure how the spinal anesthesia works as part of the operative plan in the treatment of severe hyperthyroidism. It is logical to believe that it knocks out the sympathetic innervation to the adrenal glands. We have removed some goiters entirely under pentothal anesthesia, but the operative and postoperative course has not been as impressive as when spinal anesthesia is also used. I can recall no instance of thyroid crises postoperatively since we have used the above operative plan. I think all of us have been impressed with how smooth the operative and postoperative course is in these patients in which we use a combination of intravenous, spinal, and inhalation anesthesias. Instead of stage procedures, we can do bilateral subtotal thyroidectomy at one operation. Some of the patients are out of bed on the second day. Michel clips are removed, half on the third day and the remaining on the fourth day. Most of the patients go home on the fifth and sixth day.

WOMAN'S AUXILIARY

MRS. RAYMOND J. JOSEWSKI, *President*
Stillwater, Minnesota
MRS. W. H. RUCKER, *Publicity Chairman*
Minneapolis, Minnesota

Goodhue County

Mrs. E. M. Baldigo, secretary of Goodhue County Medical Auxiliary, sends in a most interesting résumé of her organization's activities during the past year. Mrs. Aanes, of Red Wing, as president, has led the group in a program which included Red Cross knitting, nutrition classes and Round Robin letters to service men's wives. Congratulations on a good year's work.

Hennepin County

The annual meeting of the Hennepin County Medical Auxiliary was held May 7 at a luncheon meeting at 510 Groveland. Mrs. J. M. Hall, vice president, presided in the absence of Mrs. James A. Johnson, president. Annual reports from committee chairmen were given, highlights among these being the work of Mrs. Tunstead's group at the War Bond Booth in the Medical Arts Lobby, and the benefit party which netted well over three hundred dollars.

Mrs. Harold Wahlquist was welcomed in as president for the coming year and Mrs. J. M. Hall as president-elect. Other officers elected were:

First Vice President.....Mrs. H. W. Quist
Second Vice President.....Mrs. T. J. Kinsella
Treasurer.....Mrs. F. L. Bryant
Recording Secretary.....Mrs. L. W. Fink
Corresponding Secretary.....Mrs. E. O. Dahl

The auxiliary was very happy to have as special guests to the luncheon, our State President, Mrs. R. J. Josewski of Stillwater, and our Finance Chairman, Mrs. J. Dordal of Sacred Heart.

Park Region

On April 28 the Park Region Medical Auxiliary members had dinner with their husbands at the River Inn.

Following the dinner auxiliary members were guests of Mrs. O. V. Johnson at her house.

The annual business meeting was conducted by the president, Mrs. A. J. Lewis. The following officers were elected:

President.....Mrs. A. J. Lewis
Vice President.....Mrs. Frank Naegeli
Secretary.....Mrs. W. O. B. Nelson
Treasurer.....Mrs. Peter Boysen

Southwestern Minnesota

Mrs. R. J. Josewski, state president, shared honors with Dr. Stephen H. Baxter of Minneapolis, president of the Minnesota State Medical Association, at a dinner given in the Thompson Hotel in Worthington, Minnesota, on Tuesday, April 27, by Southwestern Minnesota Medical Society.

After the dinner, the auxiliary members were guests at the home of Dr. and Mrs. B. O. Mork, Jr., where the business meeting followed.

Stearns-Benton Counties

Annual reports were made at the dinner meeting of Stearns-Benton Medical Auxiliary in May. These reports showed a successful year under the leadership of Mrs. R. N. Jones despite the added burden of wartime restrictions.

Among the many activities undertaken was the hospital project which the auxiliary has sponsored over a period of many years. The sum of $50 is contributed annually. There is a rummage sale, and a layette project which is ready for any emergency, in charge of Mrs. Julian Buscher.

Many hours were devoted by auxiliary members to Victory Aides, home nursing, first aid, surgical dressings.

A sum of money was contributed to the Victory book campaign and a war bond was purchased during the April drive.

Five dollars was voted by the auxiliary to the Service Men's canteen.

Officers were re-elected as follows:

President	Mrs. R. N. Jones
Vice-President	Mrs. William Friesleben
Recording Secretary	Mrs. J. J. Gelz
Treasurer	Mrs. T. W. Hovorka
Corresponding Secretary	Mrs. T. M. Fleming
Auditor	Mrs. J. B. Beuning

Washington County

Washington County Medical Auxiliary had a Dutch Treat dinner at White Pine Inn on Tuesday, April 13. A short business meeting followed.

Of General Interest

Dr. and Mrs. R. F. Pierson of Slayton are the parents of a daughter, Marlys Sue, born April 5, 1943.

* * *

Dr. and Mrs. D. Kalinoff and daughter of Stillwater have returned from an extended tour of the southwestern part of the country.

* * *

Dr. J. S. Schrader, physician and surgeon in Springfield for more than thirty years, is now located in Lamberton.

* * *

Dr. and Mrs. M. M. Loucks have recently moved to Northome, where Dr. Loucks has established a practice. They formerly lived in Alvarado, Minnesota.

* * *

Dr. Gilbert Cottam, formerly of Minneapolis, has been appointed Superintendent of the South Dakota State Board of Health, with headquarters at Pierre.

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Dr. R. Wynn Kearney of Mankato is attending Harvard Medical School for a course in surgery preparatory to reporting for active duty as a captain in the Medical Corps.

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Dr. Edward A. Hackie of Hallock left his practice in April to serve in the Medical Corps as a lieutenant. He plans to return to Hallock after the war to resume his practice of medicine and surgery.

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Dr. and Mrs. L. H. Hammar of Butterfield, with their two children, have moved to Two Harbors, where Dr. Hammar is a member of the clinic and of the medical staff of the Two Harbors Hospital.

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Dr. N. N. Sonnesyn of Le Sueur reported for duty in the Medical Corps of the Army in May, with the commission of captain. At present he is at the Fitzsimons General Hospital in Denver, Colorado.

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Dr. R. S. Madland of Fairfax left early in May for service in the Medical Corps of the Army, with the rank of captain. He will be stationed at the Army Hospital, Springfield, Missouri, following a training period at Carlyle Barracks, Pennsylvania.

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With the departure of Dr. Ralph T. Edwards to Bigfork, Montana, the village of Elysian is without the services of a physician for the first time in many years. Dr. Edwards had practiced in Elysian for the past twenty-eight years.

Dr. N. T. Norris of Caledonia has taken over the operation of the Caledonia Hospital, which will continue to be open to physicians and surgeons in the community for the treatment and care of their patients. Dr. Norris will also continue his association in practice with Dr. G. B. Belote.

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Dr. A. A. Giroux, formerly of Moose Lake, has moved to Taylors Falls, where he has opened offices for the practice of medicine. Dr. Giroux will occupy the office of the late Dr. C. A. Kelly.

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Dr. Ralph Rossen, superintendent of the Hastings State Hospital for the past five years, has left for Bethesda, Maryland, for active duty in the Navy. He has received his appointment as passed assistant surgeon with the rank of lieutenant, senior grade.

* * *

Dr. John Nelson Eubank, formerly associated in public health service at the state sanatorium at Ah-Gwah-Ching, will act as superintendent of Sand Beach Sanatorium at Lake Park during the absence of Dr. R. R. Hendrickson, on leave of absence in government work.

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Dr. Henry Hutchinson, assistant superintendent of the Moose Lake State Hospital for the past five years, has been appointed superintendent of the Hastings State Hospital, to succeed Dr. Ralph Rossen, who has entered service as a lieutenant in the Navy. Dr. Hutchinson practiced in New London, Minnesota, before entering state service at the Willmar State Hospital.

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Dr. H. C. Doms of Slayton and Dr. Thomas Lowe of South Saint Paul have been elected to active membership in the International College of Surgeons and will receive their degrees and diplomas of membership at the convocation of the United States Chapter of the College to be held in New York City, June 14, 15 and 16.

* * *

Dr. H. W. Sybilrud, physician and surgeon of Bricelyn for the past twenty years, is now with the Marines in the South Pacific, serving as Commander. Commander Sybilrud, who is a veteran of World War I, volunteered for service in the U. S. Navy in February, 1941. He received his promotion from lieutenant-commander to commander last July.

* * *

Lieutenant Colonel W. J. Eklund, Duluth surgeon, has been appointed base surgeon of an overseas command with several posts under his jurisdiction. During World War I, Colonel Eklund served with the American Expeditionary Forces in France as a first lieutenant in the Medical Corps. He participated in the Louisiana maneuvers last year as regimental surgeon in

the 125th field artillery, 34th division, and later was assigned to a post in Boston. He was later stationed on Governors Island, New York, for two months before being ordered to overseas duty. His son, Corporal Robert D. Eklund, is serving with the American Rangers in Africa.

* * *

Dr. R. R. Hendrickson of Lake Park has been granted a three years' leave of absence by the commission of Sand Beach Sanatorium to enter government service with the United States Public Health Service. Following a period of training in Washington, D. C., Dr. Hendrickson will be stationed in Juneau, Alaska. He has been commissioned a surgeon, which is comparable in rank to major in the military service.

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Dr. B. R. Kirklin, director of the division of radiology in the Mayo Clinic, has been appointed x-ray consultant in the office of the Surgeon General of the Army, with the rank of colonel. During World War I, Colonel Kirklin served as first lieutenant in the Medical Corps and was instructor in the Army School of Roentgenology, Fort Riley, Kansas, and chief roentgenologist at the Army General Hospital, Fort Bayard, New Mexico.

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As the result of a special call for donations of spare or discarded instruments and surplus drugs as contributions to the Medical and Surgical Relief Committee of America, a most satisfactory contribution to this salvage material was made at the Committee's exhibit booth at the State meeting held in Minneapolis last month. Dr. Claude C. Kennedy of Minneapolis is chairman of the Minnesota division of the committee, which last year was responsible for collecting well over 12,000 pounds of salvage material such as examining tables, sterilizers and other equipment including much-needed drugs. Members of the Woman's Auxiliary of the State Association have been active in soliciting contributions and assisting the committee in other ways. The present aim of the Committee is to provide Coast Guard patrol boats, Navy subchasers and destroyer escorts with portable emergency medical kits. Filled with essential drugs and instruments, this kit, especially designed for small craft, is prepared to take immediate care of war casualties until the ship arrives at a base hospital. In addition to the medical supplies, the kit carries a simple fishing rig, bait and signaling mirrors—vital tools in the event of shipwreck when a crew may be stranded or must resort to life rafts.

Minnesota doctors who are members of the Medical and Surgical Relief Committee, of which Dr. Kennedy is chairman, are: Dr. Alice H. Fuller, Dr. Gilbert J. Thomas, Dr. Emil C. Robitshek, and Dr. Owen Wangensteen of Minneapolis; Dr. Donald C. Balfour and Dr. Henry W. Meyerding of Rochester; Dr. William R. McCarthy of Saint Paul; Dr. Edward Bratrud of Thief River Falls, and Dr. J. F. Norman of Crookston.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

OUTLINE OF ROENTGEN DIAGNOSIS. An Orientation in the Basic Principles of Diagnosis by the Roentgen Method. Second Edition. Leo G. Rigler, B.S., M.S., M.D. Professor of Radiology, University of Minnesota, Minneapolis. 196 pages plus atlas of 254 illustrations. Price, $6.50, cloth. Philadelphia: J. B. Lippincott Co., 1943.

UROLOGY IN GENERAL PRACTICE. Nelse F. Ockerblad, B.S., M.D., F.A.C.S., Professor of Clinical Urology, University of Kansas School of Medicine; Senior Attending Urologist to St. Luke's Hospital; Consulting Urologist to the Children's Mercy Hospital, Kansas City, Mo.; Diplomate of the American Board of Urology, and Hjalmar E. Carlson, B.S., A.M., M.D., F.A.C.S., Instructor in Urology, University of Kansas School of Medicine; Attending Urologist to St. Luke's Hospital and Trinity Hospital, Kansas City; Diplomate of the American Board of Urology. 383 pages. Illus. Price, $4.00, cloth. Chicago: Year Book Publishers, 1943.

ESSENTIALS OF SYPHILOLOGY. Rudolph H. Kampmeier, A.B., M.D. Associate Professor of Medicine, Vanderbilt University School of Medicine. In charge of the Syphilis Clinic and Visiting Physician to Vanderbilt University Hospital. 518 pages. Illus. Price, $5.00, cloth. Philadelphia: J. B. Lippincott Co., 1943.

CONVULSIVE SEIZURES. How to Deal with Them. A Manual for Patients, Their Families and Friends. Tracy J. Putnam, M.D. Professor of Neurology and Neurosurgery, College of Physicians and Surgeons, Columbia University; Director of Services of Neurology and Neurosurgery, Neurological Institute of New York. 168 pages. Illus. Price, $2.00, cloth. Philadelphia: J. B. Lippincott Co., 1943.

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